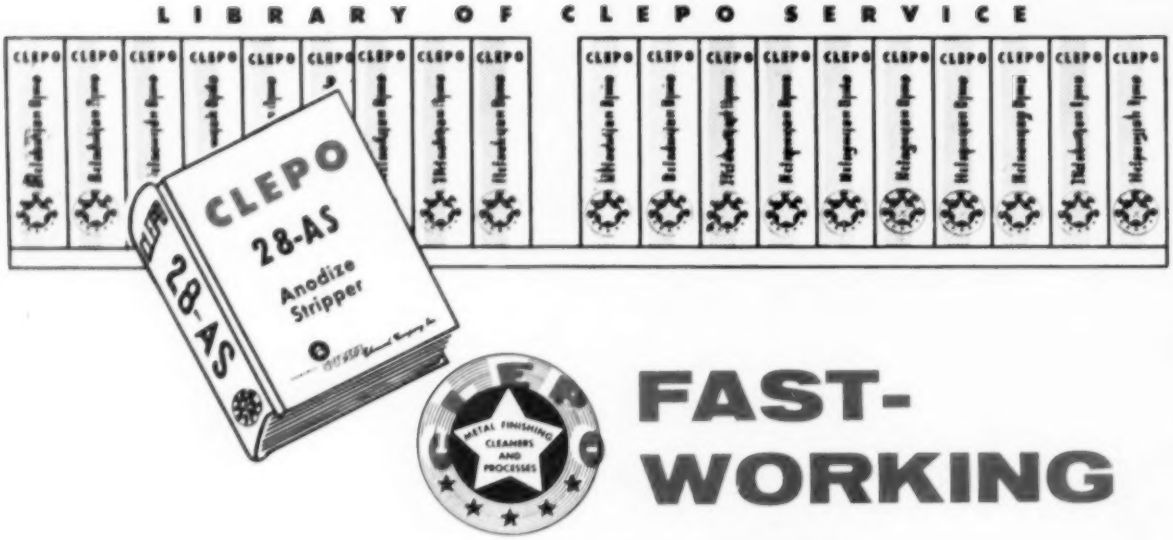
plating

JOURNAL
OF THE
AMERICAN
ELECTROPLATERS'
SOCIETY

JULY 1957

University Microfilms
313 N. First St.
Ann Arbor, Michigan



FAST-WORKING

28-AS

ANODIZE STRIPPER

- it's an alkaline powdered compound
- dissolves readily in tap water at room temperature; mild steel tank can be used
- very stable; quantity can be made up in advance
- negligible attack on base metal under normal application
- strips racks without alkaline pre-clean
- Available in 800 pound drums or small quantities.

The effectiveness of and simplicity of preparation and handling makes CLEPO 28-AS the preferred 'stripper' in many plants anodizing aluminum products.

CLEPO 28-AS provides another example of the broad-scale service Gumm Technicians are rendering your industry. They are in position to offer many CLEPO formulations to take care of the many cleaning, stripping, etching and other problems. And CLEPO Field Men are always ready to help in setting up better methods and to recommend better compounds.

If you are working on anodized products, try CLEPO 28-AS. Make a thorough test along side of your present methods. If you are working on other metals why not discuss your problems with the CLEPO Field Representative? You will find CLEPO Products most effective compounds.

FREDERICK

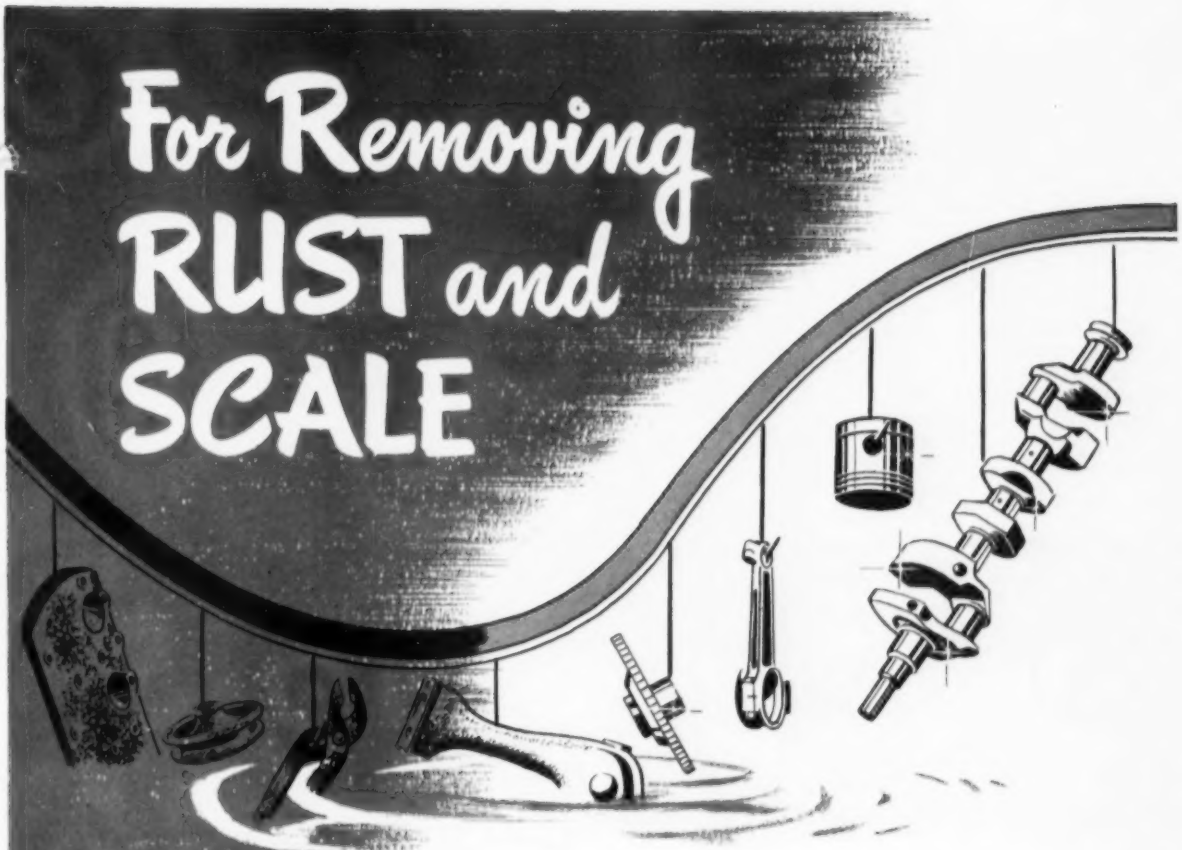
7-FG2

GUMM Chemical Company Inc.

538 FOREST STREET, KEARNY, N. J

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 700.

For Removing RUST and SCALE



ALKA-DEOX® DERUSTING PROCESSES. Alkaline materials used both electrolytically and non-electrolytically for rapid removal of rust and scale from steel, cast iron and malleable iron. No attack on basis metal. Uses Enthone Alka-Deox 114 and Alka-Deox 134.

ENTHOL® — CLEANER AND RUST REMOVER FOR STEEL. A solvent acid cleaner for rapid removal of oil, rust and oxide from steel, zinc, aluminum and other metals to prepare them for painting or organic finishing.

DESCALER 2A — POWDERED ACID PICKLING COMPOUND. A powdered acidic compound added to water to make pickling solutions for iron and steel. Safer to handle than sulphuric acid. Gives controlled acidity to prevent overpickling.

ACTANE® 70 — POWDERED COMPOUND REPLACES HYDROFLUORIC ACID. A dispersing agent added to acid pickles to remove colloidal and siliceous films from metals. Also an additive for sulphuric and nitric acid pickles to promote faster pickling of stainless steel, aluminum and titanium.

INHIBITOR 8 — STOPS ACID ATTACK ON STEEL. An all-purpose inhibitor for acids including sulphuric and hydrochloric acids to stop attack on steel during pickling.

ACID ADDITION AGENT —STOPS ACID FUMES. A surface active material extensively used in acid pickles to reduce fuming, to give better wetting, and to promote better pickling.

Write for fully descriptive literature.

ENTHONE
INCORPORATED

442 ELM STREET, NEW HAVEN 11, CONNECTICUT
Metal Finishing Processes • Electroplating Chemicals

Completely automatic, unattended unloading end of the Stevens Automatic Barrel showing control panel and rectifier site located above machine.

Unistrut says— "COSTS 50% LOWER— FINISH BETTER with . . . STEVENS AUTOMATIC BARREL MACHINE"

Every day in the Unistrut Corporation plant, Wayne, Michigan, thousands of small parts are zinc plated and shipped to Unistrut warehouses throughout the United States. All of these parts are zinc plated automatically by a Stevens Automatic Barrel Machine.

Unistrut high standards require a uniformity of plate on the parts used in their metal framing systems. But since installing the Stevens Automatic Barrel they have reported other advantages as well—"less handling, smaller inventories and quicker shipments." When you consider the 50% cost savings of actual plated parts too, it all adds up to a terrifically profitable investment.

Why don't you tell us your metal finishing problems and let us make recommendations. There's no obligation.

Side view of machine showing excellent drainage system.

Plating section of machine with ventilating duct work.

Write today for your copy of the 1957 bulletin, "The Modern Concept . . . Stevens Automatic Barrel Processing and Plating Machine." Write to Frederic B. Stevens, Inc., 1800—18th Street, Detroit 16, Michigan.

STEVENS 75 YEARS OF SERVICE

FREDERIC B. STEVENS INCORPORATED

YOUR METAL FINISHING SUPERMARKET

DETROIT 16, MICHIGAN

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 702.

An Educational Society for the Advancement of the Science of Electroplating, the Finishing of Metals and Allied Arts

John P. Nichols
Chairman, Editorial Board and Managing Editor

Rodney Leeds
Editor

Donald C. Austin — **Dr. Russel E. Harr**
Dr. Abner Brenner — **Arthur W. Logozzo**
John B. Capuano — **Dr. Abraham M. Max**
G. Ross Davidson — **Robert D. Miller**
S. Lewis Doughty — **Fremont L. Scott**
William M. Tucker
Editorial Board

Thomas W. Lowe
Production Manager

H. A. Johnston
Advertising Manager

Loretta B. Ehrhardt
Advertising Assistant

Bob Wettstein & Associates
Western Advertising Representatives

Los Angeles 57
672 S. Lafayette Park Place
Phone: DUnkirk 8-2286

San Francisco 8
209 Post Street
Phone: YUkon 6-2522

Portland 5
921 SW Washington Street
Phone: CApitol 8-4107

SOCIETY of BUSINESS MAGAZINE EDITORS

Cover Designed by James A. Civille.

plating

Journal of the American Electroplaters' Society

July 1957 **Vol. 44, No. 7**

EDITORIAL:

What Constitutes a State? 739

Nickel Will Stretch 757
by Cleveland F. Nixon

Accelerated Corrosion Tests for the Performance of Plated Coatings—Fourth Progress Report 763
by Walter L. Pinner

Summaries of Completed AES Research Projects 767

New AES National Officers 777

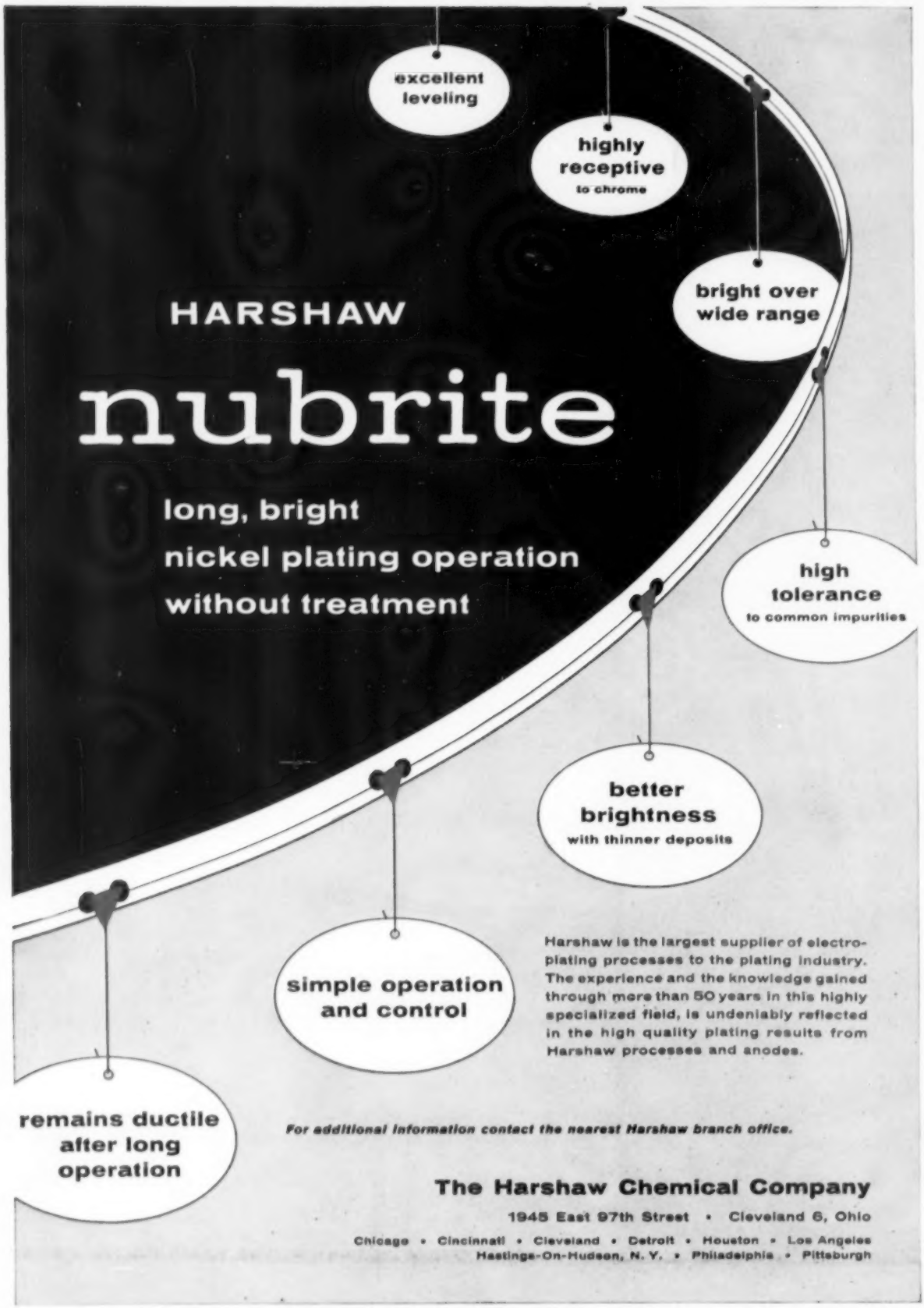
Financial Report 778

Technical Paper Award Winners 783

Convention Candids 784

AES Branch Directory 819
AES Directory 820
AES Membership Report 818
AES News 786
Article References 804
Books 787
Branch News 808
Classified Advertisements 818
Equipment and Supplies 800
Future Meetings 820
Industry News 792
Industry News Briefs 795
Index to Advertisers 821
Intersociety News 788
Mailbox 806
Patent Abstracts 789
Personals 796
Trade Literature 806

Published by the American Electroplaters' Society, Incorporated, 445 Broad Street, Newark 2, N. J. Phone: HUmboldt 2-3400. Yearly subscription for Members $2.00. Nonmembers U. S. and Canada $5.00, 65c a copy. Foreign, $8.00 a year, $1.00 a copy.
Copyright, 1957, by the American Electroplaters' Society, Incorporated.
PLATING is abstracted regularly in Chemical Abstracts, Metals Review, Metallurgical Abstracts, Engineering Index, Technical Data Digest, and Bulletin Analytique.
Statements of fact and of opinion given in articles and papers in PLATING are those of the contributors. The American Electroplaters' Society assumes no responsibility for them.
Articles appearing in this publication may not be reproduced in full or in part without express permission of the Managing Editor.
Published monthly at 5800 N. Marvine St., Philadelphia 41, Pa. Entered as second class matter July 1, 1946, at the Post Office at Philadelphia, Pa., under Act of August 24, 1916.


excellent leveling
highly receptive to chrome
bright over wide range
HARSHAW
nubrite
long, bright nickel plating operation without treatment
high tolerance to common impurities
better brightness with thinner deposits
simple operation and control
remains ductile after long operation
Harshaw is the largest supplier of electroplating processes to the plating industry. The experience and the knowledge gained through more than 50 years in this highly specialized field, is undeniably reflected in the high quality plating results from Harshaw processes and anodes.
For additional information contact the nearest Harshaw branch office.
The Harshaw Chemical Company
1945 East 97th Street • Cleveland 6, Ohio
Chicago • Cincinnati • Cleveland • Detroit • Houston • Los Angeles
Hastings-On-Hudson, N. Y. • Philadelphia • Pittsburgh

EDITORIAL

WHAT CONSTITUTES A STATE?

YEARS AGO, with a college classful of others, the writer remembers hearing the commencement address delivered to us that day by the president of our university, the late Dr. Nicholas Murray Butler, distinguished scholar-orator.

"What constitutes a State?" he began—quoting from the hallowed poem by that title.

"Not high raised battlements or labored mound," he continued, "thick walls or moated gates . . . but MEN, high-minded men . . ."

Memory retraced itself to that occasion and to that sensible opening of that memorable address as we listened to the deliberations of the Supreme Society, the AES's highest governing council, at its recent Annual Meeting in Montreal. Here, three delegates from each of the Society's 56 Branches, these composing the Supreme Society, weighed, debated, shaped and legislated action affecting not only the present of the AES but also its immediate and its long-range future.

A business company, an Association, a Society, any such enterprise, that has survived competitive struggles for nearly five decades, including two world wars and history's most devastating business depression, must at least have sound fundamental policies patterned and developed by able Men.

And as we listened at Montreal, we recognized that in this Society's nearly half-century existence, predecessor men like these, at similar Annual Meetings, charted the course that enabled the Society, from scratch, to survive the vicissitudes of that long span, and to reach its present sizable stature of 7521 members in all ramifications, residing globally.

What does the future hold in store for this Society? Manifestly, the answer will largely depend upon the actions of Men in council—both Delegates and Society officers at national level, and Officers and Committee leaders at Branch level.

Members' wise choice of these Men must, therefore, determine the AES's future because MEN, as Dr. Butler so aptly said, must essentially MOULD and CREATE it.

John P. Nichols

Executive Secretary

TYGORUST—

bonds vinyls and other finishes securely after minimum surface preparation

Before the development of Tygorust it was frequently necessary to sandblast, scrape or chip rusted surfaces before priming could be started. Now, with Tygorust, it is only necessary to wire-brush loose rust and scale—and prime. The surface need not even be dry. Tygorust works equally well on damp or dry surfaces, penetrating through the rust to lock securely to the steel itself. It bonds tightly to clean or rusted steel and eliminates underfilm rust-creep—it goes over firmly adhering old paint (excepting bituminous coatings). It successfully primes damp or dry concrete—in fact with its unusual properties it makes an ideal general purpose primer for plant-wide maintenance. It is easy to apply by brush or spray and provides economical coverage.

Tygorust is the perfect priming base for vinyl-based paints, making them as easy to use as ordinary paints. But Tygorust works equally well with all other types of finish coat too. However, for the ultimate in corrosion resistance topcoat Tygorust with Tygon Protective Paints. Tygon and Tygorust are a time-tested team that provide the maximum in plant-wide corrosion protection.

430E

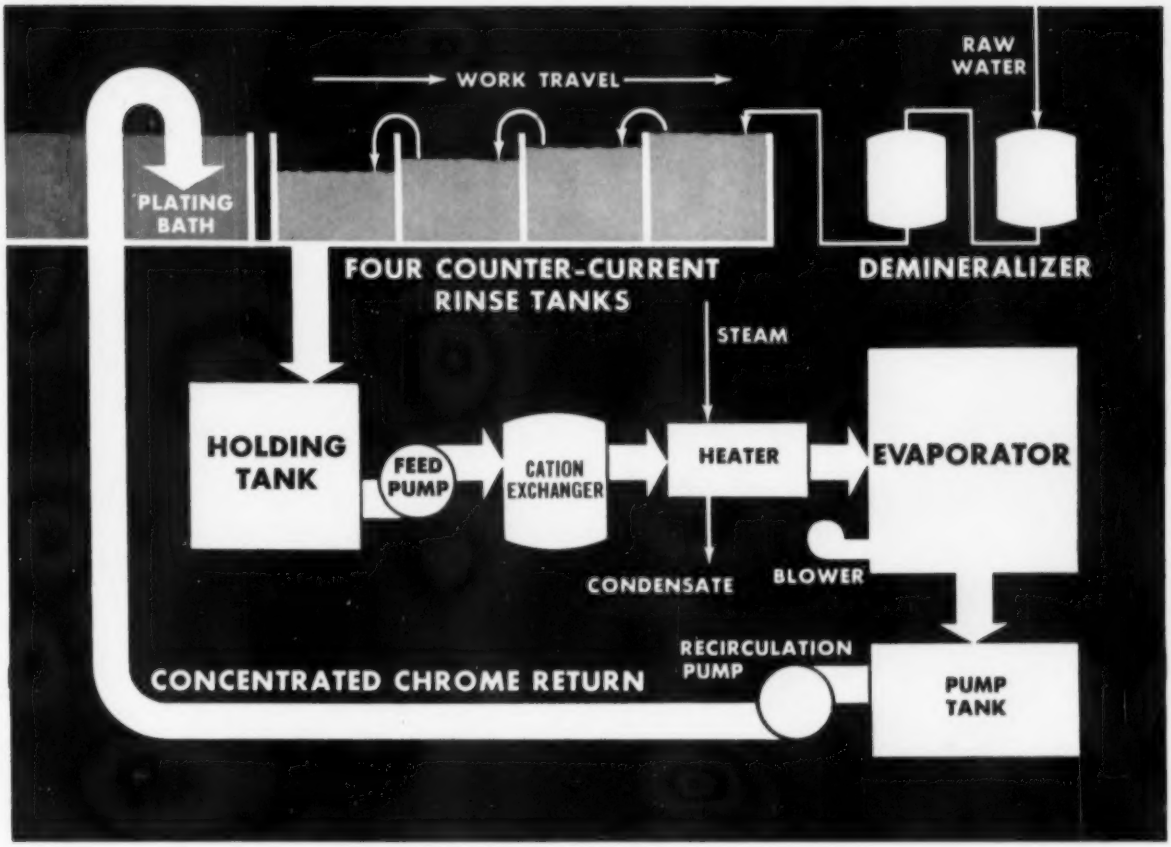
TO HELP YOU COMBAT CORROSION...

Write for your free copy of The Tygon Paint Manual. Its 30 pages contain a wealth of helpful facts. Subjects include: Surface preparation; top coating for corrosive service; maintaining painted surfaces; solutions to common spray problems; and other subjects of equal interest.

Plastics and Synthetics Division

U. S. STONEWARE

AKRON 9, OHIO



Chromium recovery costs less than destruction!

Designed for a large auto manufacturer, this Industrial Chromic Acid Recovery System was carefully analyzed for operating costs, including labor, power and amortization. When compared with a destruction system of equal capacity, ***Industrial's system shows a net daily GAIN of $26.65 against destruction*** *COSTS OF $54.06**

How Industrial engineered the system

After a thorough analysis of the entire plating operation, Industrial engineers recommended that the rinse water flow rate be reduced. When this was done, rinsing was still efficient and complete with less than 4 ppm acid concentration in the final tank . . . but the higher concentration in the first tank made it possible to use a fast, convenient evaporator to recover chromic acid. No pre-concentration was needed (the small cation exchanger only removed metal contaminants). Industrial then planned and built the entire system including tanks and pumps.

We hope you noticed the key words . . . "thorough analysis" in the paragraph above. This is typical Industrial engineering—and at the auto plant it led to truly impressive gains in plating efficiency and economy. Why not use this kind of service yourself... ***To solve your plating problems call Industrial*** . . . and work with the men most experienced in the industry at handling plating solutions—all along the line.

*See article "Profitable Recovery of Plating Wastes by Reconcentration of Reduced Volume Rinses"—Odlund & Hesler. Plating, August, 1956. Reprints are available of this paper by two Industrial engineers.

Send for complete data . . .

INDUSTRIAL

FILTER & PUMP MFG. COMPANY
5914 OGDEN AVENUE • CHICAGO 50, ILL.

Please send me literature and reprints of articles on plating waste disposal.

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

FREE* "SQUEEZ-ON" APPLICATOR OF NEW XL-8 AIR-DRY COATING FOR RACKS and MAINTENANCE

WITH YOUR TRIAL ORDER OF ONLY 1 GALLON... XL-8

4 outstanding characteristics make XL-8 the most practical, and economical for your plant!

1. **XL-8 is Quicker, Easier Applied**—saves time, money. **Dip, spray or brush.** No ovens necessary. No special skill or equipment. Apply over any air-dry or baked-on coatings. Replaces "putty" patching. Faster drying.
2. **XL-8 for Improved Adhesion**—superior to other air-dry coatings. Tighter bond on ferrous and non-ferrous metals. Protects contact points and entire rack. Stops carry-over and solution contamination.
3. **XL-8 for Coating Thickness**—builds up faster. Only 2 to 3 dip coats for normal use. (Compare with 7 coats of some air-dry systems.) Uniform thickness on dipped racks, from heavy splines to thin wire contacts.
4. **XL-8 is More Economical**—more protection for your money. Tougher, elastic surface, resists abrasion and cutting. Non-contaminating, resistant to plating solutions. Won't spall or blister. Best low-cost air-dry coating for hundreds of uses.

the G.S. plastics company
15583 Brookpark Rd., Cleveland 11, Ohio
CLearwater 2-4777

New formula—superior to any air-dry coating you've ever used! Try new, improved XL-8 at our expense.

Order just one gallon ($7.95 per gal.) and we'll include with it the handy-patcher "SQUEEZ-ON" applicator, filled and ready to apply **at no extra cost.** Use the FREE XL-8 in applicator for all your rack patching, general maintenance, etc. Make XL-8 **prove itself.** If, within 30 days, you're not entirely satisfied, **return the unopened gallon of XL-8 to us, and we'll refund full purchase price.**

You can't lose! By every test, XL-8 is the **most versatile** and **effective** air-dry coating formulated today. Perfect for patching coated racks (adheres to any metal, or original coating—baked or air-dry). Tops for rack development programs. Ideal for job shop and **all** plating runs using light racks. Unsurpassed for general maintenance—outside of tanks, spillage areas, tote boxes, funnels, hooks, carrier bars, conveyors, baskets, etc., or emergency repairs. Quicker, easier applied, faster drying, tougher, goes farther. Order now. Limited-time offer.

Clip coupon (below) to your letterhead or P. O.
Cash with order unnecessary. We'll invoice you.

The G. S. Plastics Co., 15583 Brookpark Rd., Cleveland 11, Ohio

* Ship sample "Squeez-on" applicator of XL-8 FREE, with 1 gallon XL-8 ($7.95 per gal. f.o.b. Cleveland, O.) We'll use the applicator and, if not satisfied, will return unopened gallon of XL-8 within 30 days of this order, for full credit or refund.

i'so [Greek, *isos*, equal]

i'so-brite® [Proprietary Name] Plating addition agents which produce plating of uniform brightness.

wagner i'so-brites®—The plating chemical line with

THE BIG PLUS

And that BIG PLUS is the advantage of one source, one responsibility. If you buy plating or influence plating specifications — or carry heavy cost responsibilities in a plant which turns out a plated product, you may be well aware of the tendency to hop-scotch around from one proprietary plating solution to another. Why? You're searching for uniform high quality, low cost, ease of operation — but above all, one responsibility at the source. And until the Wagner ISO-BRITE proprietaries were introduced, that one responsible source did not exist.

The Wagner ISO-BRITE line includes copper, nickel, zinc, cadmium and white brass addition agents. Take the entire line — or any one product — and you'll find they are trouble free above any on the market. They meet the most unbending specifications for fine grain (brightness), speed of deposition, low cost and stability. And you'll see a big drop in down time and service calls with ISO-BRITE solutions in every tank. We are justified in making these strong statements since the entire line is processed in our own plants under the watchful eye of the laboratory which developed it. We gladly assume full responsibility for uniformity of performance.

And speaking of THE responsible source, the combination of ISO-BRITE proprietaries and Wagner anodes, rectifiers and automatic or still tank equipment, backed up by Wagner engineering and service, means better quality, fewer service headaches, more profit. Call the Wagner man in your area or write.

MANUFACTURERS AND PROCESSORS OF ALL METAL-FINISHING CHEMICALS, ANODES, AND EQUIPMENT

400 MIDLAND AVE., DETROIT 3, MICHIGAN

CHICAGO • CINCINNATI • CLEVELAND • INDIANAPOLIS • NEW YORK • ROCHESTER • GRAND RAPIDS

Wagner BROTHERS INC.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 707.

For 59 Years ...L'HOMMEDIEU...

year after year has manufactured Reliance Plating, Polishing Equipment, Supplies for Better and More Profitable Metal Finishing

RELIANCE PLATING BARRELS

Easy to Handle . . . Save Time and Money
Uniform Current Distribution
Plating Begins at Once

* * *

Lucite — Hard Rubber or Bakelite Cylinders
Motor — Geared in Head
Minimum Maintenance

* * *

Write for Reliance Plating Barrel Specifications

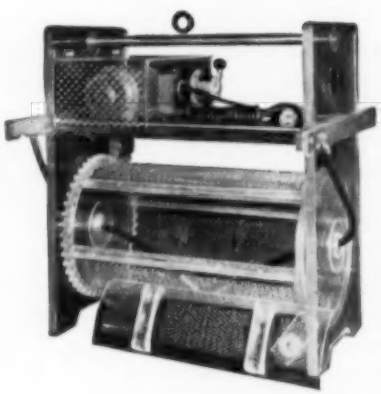
RELIANCE SELENIUM RECTIFIERS

Designed for all metal finishing operations.

High power factor and low ripple.

6 to 48 volts D.C.

Basic-self-contained or with Remote Control.



RELIANCE LUCITE

Portable Plating Barrel

Built of extra heavy High Temperature Lucite for volume production and stability.

Cylinder: 10"x18" inside. Equipped with Reversing Switch to permit stopping and securing barrel for loading and/or unloading.

Chas. F. L'Hommedieu & Sons Co.

MANUFACTURERS OF METAL FINISHING EQUIPMENT AND SUPPLIES

GENERAL OFFICE AND FACTORY

4521 OGDEN AVE. CHICAGO 23, ILL.

Chas. B. Little Co.
Newark, N. J.

W. R. Shields Co.
Detroit, Mich.

Branches:
Cleveland & Los Angeles

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 708.

Now! An alkaline rust and smut remover that really works!

NEW WYANDOTTE FERLON

Simple to use, foolproof in action . . . eliminates metal etching and hydrogen embrittlement . . . combines several operations into one

Here's another new member of Wyandotte's complete line of advanced, top-quality metal-finishing products: Wyandotte FERLON! It's a versatile, fast-acting alkaline rust and smut remover — for use with or without current — that wins hands down over all other similar products in treating steel!

Here's what FERLON will do:

- **REMOVES RUST AND OXIDES** from steels, including stainless steels, without injury to sound metal. May be used as a simple immersion for light rust, or with current for heavy rust and some scales.
- **REMOVES WEATHER, HEAT, AND CHEMICAL STAINS** from steel, bronze, and copper alloys. Usually a simple dip is all that is required.
- **REMOVES SMUT.** FERLON may be added to steel electrocleaners for improved smut removal. Insures brighter electroplates, reduces roughness.
- **SHORTENS PLATING CYCLES.** FERLON eliminates the acid dip in some plating cycles — shortens cycle up to 30%.
- **REMOVES PHOSPHATE COATINGS AND PAINT** in the same tank with rust, scale, and smut, if desired.
- **ADAPTABLE** for soak tank or electrolytic use in existing equipment.

FERLON represents a big step forward in the metal-finishing industry. Chances are its versatility will shorten your production operations and save you money. Contact your nearest Wyandotte representative for a demonstration today. Or clip and mail coupon. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California. Offices in principal cities.*

Wyandotte CHEMICALS

J. B. FORD DIVISION

The Best in Chemical Products for Metal Finishing

Wyandotte Chemicals Corporation
Wyandotte, Michigan

☐ Please send latest FERLON data sheet

☐ Have representative call

Name _____

Firm _____

Address _____

City _____ Zone _____ State _____

the Mutual red carpet is out for every customer

If you use chromium chemicals, specify *Mutual*. At Mutual your order gets V.I.P. treatment from mail room to shipping room—not only when supplies are plentiful, but also when they're not.

Quality? High, uniform, the standard of industry for over fifty years. Expert technical service rounds out the picture.

Chromic Acid • Sodium Bichromate • Potassium Bichromate

MUTUAL

Mutual Chromium Chemicals

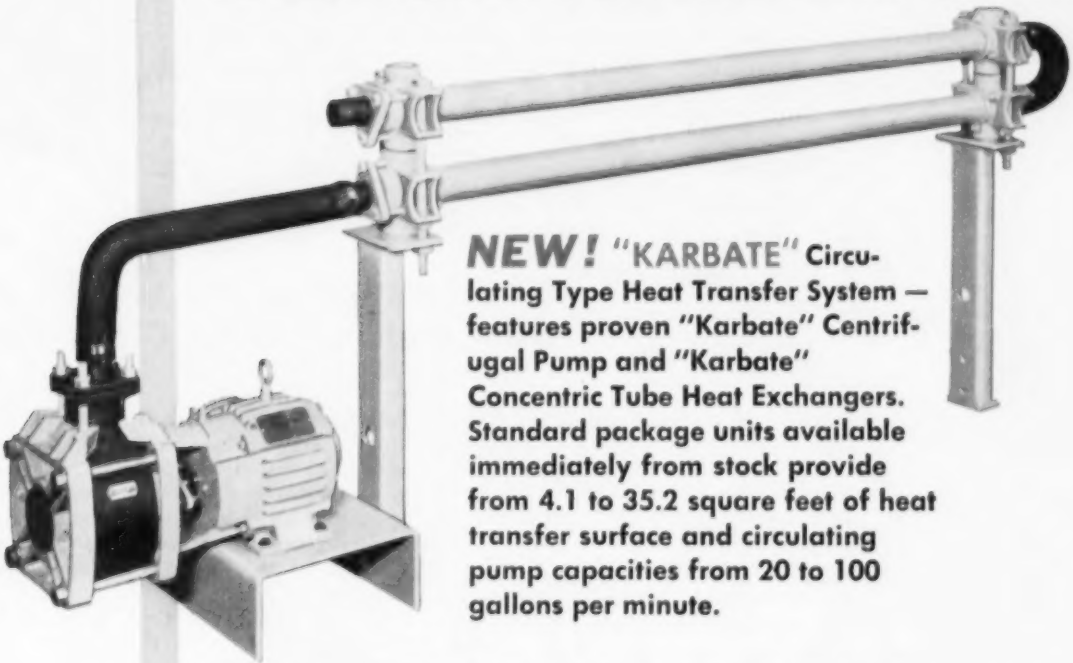
SOLVAY PROCESS DIVISION • 61 BROADWAY, NEW YORK 6, N. Y.

Allied Chemical

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 710.

Want to heat and cool plating solutions economically?

USE "KARBATE" BRAND IMPERVIOUS GRAPHITE



NEW! "KARBATE" Circulating Type Heat Transfer System — features proven "Karbate" Centrifugal Pump and "Karbate" Concentric Tube Heat Exchangers. Standard package units available immediately from stock provide from 4.1 to 35.2 square feet of heat transfer surface and circulating pump capacities from 20 to 100 gallons per minute.

Get information on these new units today!

Call your Local Distributor or write us at the address below

Take advantage of the proven corrosion resistance, low cost and long life of "Karbate" brand impervious graphite in your metal finishing processes. National Carbon manufactures a complete line of standard "Karbate" impervious graphite, including centrifugal pumps, shell and tube and concentric tube heat exchangers, plate and bayonet immersion heaters, armored pipe, fittings and valves. Complete literature and proposals on request.

"KARBATE" Plate Type Heat Exchangers

Sturdy, compact, with up to 55 sq. ft. surface area per unit. Recommended particularly for plating, cleaning, and similar tanks. Available from stock in number of standard styles and sizes — widths to 19", lengths to 94". **Catalog Section S6620.**

"KARBATE" Centrifugal Pumps

Available in a variety of sizes and models for all corrosive services, "Karbate" impervious graphite standard centrifugal pumps combine high efficiency and wide capacity range with outstanding mechanical design. **Catalog Section S7250.**

UNION CARBIDE

The terms "Karbate", "National" and "Union Carbide" are registered trade-marks of Union Carbide Corporation

NATIONAL CARBON COMPANY • **Division of Union Carbide Corporation** • ***30 East 42nd Street, New York 17, N. Y.***

Sales Offices: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco. *In Canada:* Union Carbide Canada Limited, Toronto.

IN ALL METAL FINISHING...

Liquimatic®

GIVES 25% MORE BUFFING EFFICIENCY

It's Automatic... It's Liquid... Fast Cutting, Easy Cleaning

Here's how to stop losing profit dollars in your buffing room. Go automatic! Go liquid! Get Liquimatic—the automatically-applied, fast cutting, liquid compound that's saving time and money in many plants like yours.

Liquimatic eliminates costly, time-consuming hand application and bar changing. Liquimatic works right down to the last drop, with no nubbin to throw away. You get the exact, metered amount of compound with controlled viscosity from heavy cuts to extremely high color. Buffs last up to 200% longer. The compound does the work, *not* the buff. Simple, rugged Liquimatic equipment is easy to install and maintain. Water-soluble compound is easy to wash down. Its high flash point, long life, and non-settling properties make it safer, more efficient in use, more economical in storage.

Find out about the time, labor and money-saving benefits that are yours with Liquimatic. Write today for the new Liquimatic Application System folder.

Hanson-Van Winkle-Munning Company, Matawan, N. J. Office in principal cities.

GET A FREE "LIQUINALYSIS" RIGHT IN YOUR PLANT

An H-VW-M engineer will demonstrate the Liquimatic Automatic System, without obligation, right in your own buffing room. You can quickly learn how much you can save, if you are now using bar compounds . . . and how much H-VW-M Liquimatic compound will save over other liquid compounds.

If you require a special formula, you'll see how easy your needs can be analyzed, and how the exact compound can be prepared to meet any viscosity or consistency, to suit any application from heavy cut to extremely high color.

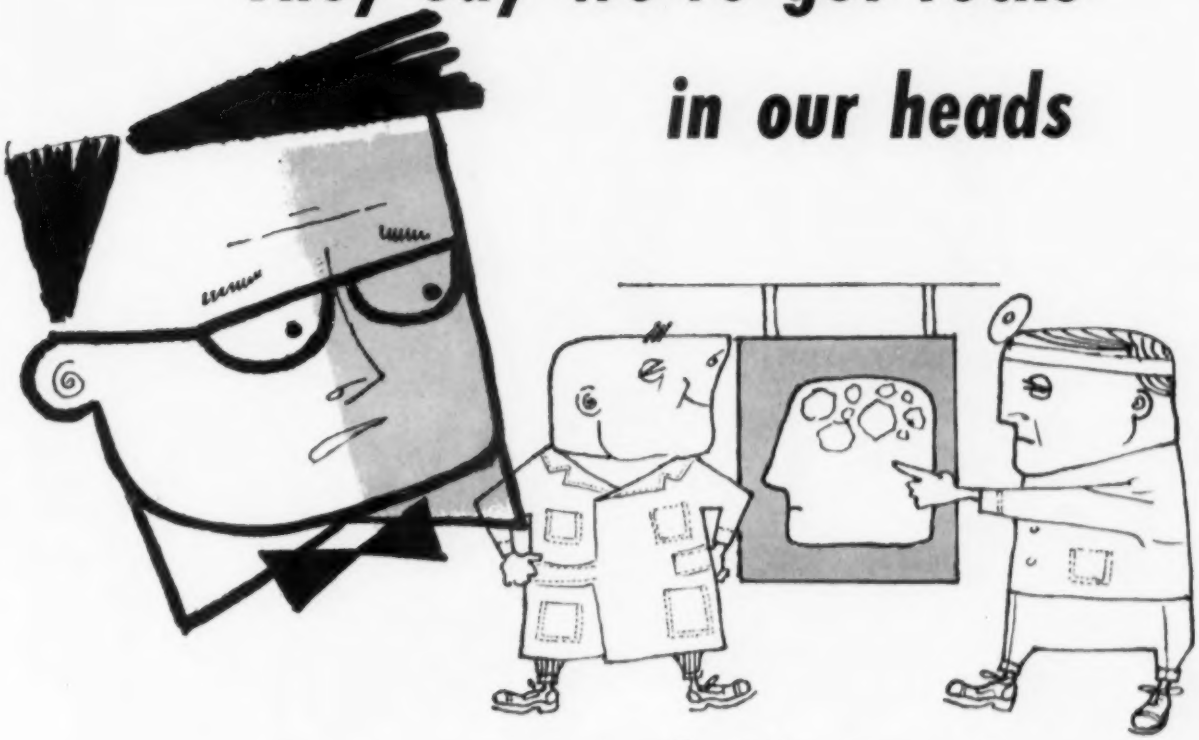
4629

H-VW-M

Industry's Workshop for the Finest in Plating, Anodizing, and Polishing Processes • Equipment • Supplies

PLATEMANSHIP – Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

They say we've got rocks in our heads



—and it's true!

We really don't mind this sort of talk. It's our business to have the types of "rocks" on our minds that are saving millions of dollars in the finishing of manufactured parts.

Roto-Finish people have studied abrasive chips and compounds since the day they pioneered the idea of precision barrel finishing. The development of new and better media for specific finishing problems has made Roto-Finish the leader in mechanical finishing. Years of research and experience in barrel finishing techniques give Roto-Finish the "know-how" to recommend the right media to do the job you want done.

If you're not satisfied with your finishing production, look to Roto-Finish for the answer. Simply send samples of your unfinished parts, a finished part, a description of your production requirements and a list of the equipment you have available. We'll prove that you can save with Roto-Finish and we'll guarantee the same results in your plant that are achieved in sample processing.

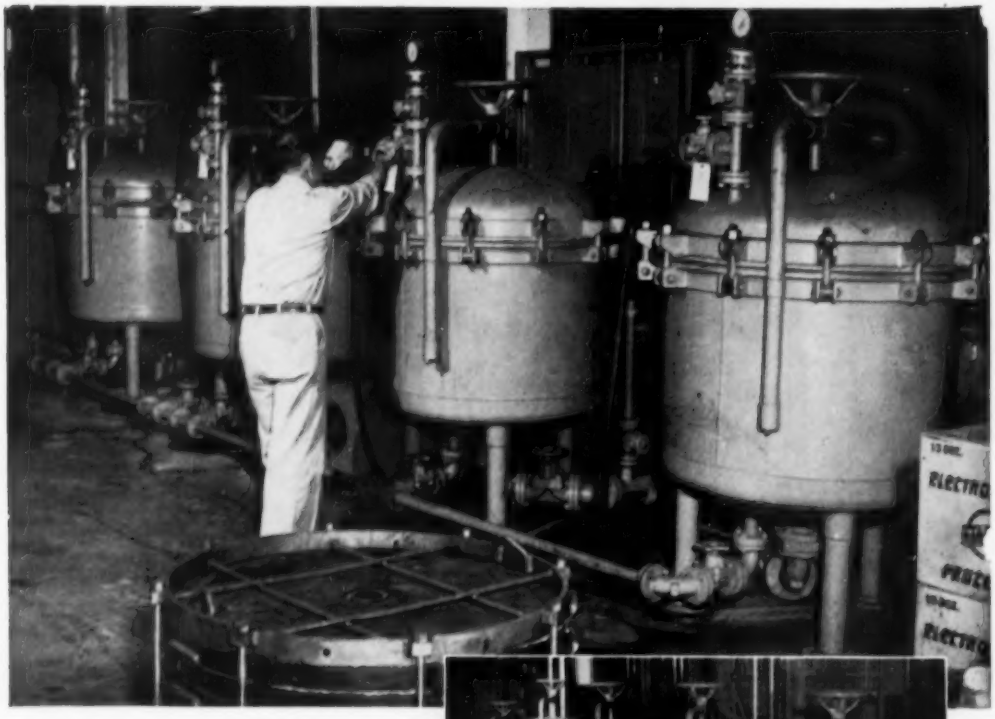
SEND FOR FREE
TECHNICAL DATA FOLDER
ON ROTO-FINISH PROCESSES

Roto-Finish
COMPANY
3703 Milham Road
Kalamazoo, Mich.

ROTO FINISH

Phone:
Fireside 3-5578

FOREIGN REPRESENTATIVES: CANADA — Toronto — Canadian Hanson & Van Winkle Co., Ltd., Cor. Silver and Morrow Aves. ENGLAND — Mark Road — Hemel Hempstead — Hertfordshire — Roto-Finish Ltd. AUSTRALIA — Cheltenham, 89 Tulip St., A. Flavell Ltd. HOLLAND — BELGIUM — LUXEMBURG — Delft, Holland — N.V. Roto-Finish Maatschappij Rotterdamseweg 370A AUSTRIA, GERMANY, SWITZERLAND, NORWAY, SWEDEN Frankfort a.M.—Metallgesellschaft A.G., Germany — Reutereweg 14 ● ITALY — Milan — Societa Roto-Finish a R.L. — Sestos S. Giovanni — Viale E. Marelli 31 ● FRANCE—Paris Societe Roto-Finish, 40-42 rue Chance Milly—Clichy, (Seine) ● BRAZIL — Rio de Janeiro — Commercial E. Industrial de Formos Werco, Ltds. rua General Gurjao, 326 ● SPAIN — Barcelona — Instituto Electroquimico, S.A. — Corcega 59.



High Flow Rates Low Servicing Cost *give* Low Cost Filtering of Plating Solutions—

2,208,000 gals. of bright nickel solution are filtered in these four Sparkler Horizontal Plate filters (top illust.) through a continuous 5 day cycle with 24 hour operation. Filters are cleaned once a week by lifting out the plate cartridge and replacing it with a fresh dressed set of plates. Only a few minutes is required for this operation.

In the same plating plant, (lower illust.) the four large Sparkler filters are used to filter suspended matter from Ronal bright copper solution. These filters have a flow capacity of 4800 G.P.H. each. The small, far end unit filters suspended matter from a copper strike bath. Capacity 2,100 G.P.H.

On occasion these filters are employed for filtering out activated carbon and lime from copper solution and activated carbon and nickel carbonates from nickel solution.

Plating Plant Engineers will find Sparkler filtration engineers most co-operative to work with on installations of any size.
Write Eric Anderson

SPARKLER
horizontal plate
FILTERS
(the original horizontal plate filter)

SPARKLER MANUFACTURING CO. MUNDELEIN, ILL.
Sparkler International Ltd.
Manufacturing plants in Canada, Holland, Italy, and Australia.

HOW WOULD YOU SOLVE IT?

1. PRODUCTION PROBLEM: To cut unit costs and increase production of grinding off parting lines and other imperfections, and polishing die-cast aluminum vacuum cleaner nozzles prior to plating. Scott and Fetzer Co., makers of famous Kirby vacuum cleaners, were using set-up wheels in a three-grit sequence – #60, #120, #220 – to do this operation. Production was 6 finished units per hour.

2. SOLUTION: A 3M Representative suggested that this Cleveland, Ohio manufacturer switch to the 3M Method using Three-M-ite Cloth Belts, Grits #120 and #220. This method increased production 116% – from 6 to 13 finished nozzles per hour – *and* eliminated one grinding operation! Too, the finer polished surface obtained with 3M Belts made for far superior final plating.

A 3M Representative can help solve *your* grinding and finishing problems, too. Call him today!

Want more information?

3M ABRASIVES

Minnesota Mining and Manufacturing Co.
Dept. MR-77, St. Paul 6, Minn.

☐ Send me FREE booklet: *"Case History Reports on 3M Abrasive Belts."*

☐ Please have 3M Representative call.

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

PRODUCT OF 3M COMPANY RESEARCH

Made in U.S.A. by Minnesota Mining and Mfg. Co. General Offices: St. Paul 6, Minn. In Canada: P.O. Box 757, London, Ontario. Export Sales Office: 99 Park Avenue, New York City.

(Advertisement)

Special Reports On Finishing Non-Ferrous Metals

NUMBER II—Paint Base, Corrosion-Resistant Finishing with Iridite

WHAT IS IRIDITE®?

Briefly, Iridite is the tradename for a specialized line of chromate conversion finishes. They are generally applied by dip, some by brush or spray, at or near room temperature, with automatic equipment or manual finishing facilities. During application, a chemical reaction occurs that produces a thin (.00002" max.) gel-like, complex chromate film of a non-porous nature on the surface of the metal. This film is an integral part of the metal itself, thus cannot flake, chip or peel. No special equipment, exhaust systems or specially trained personnel are required.

Chromate conversion coatings are well known and accepted throughout industry as an economical means of providing corrosion protection, a good paint base and decorative finishes for non-ferrous metals. However, continued developments have been so rapid and widespread that many manufacturers may not be completely aware of the breadth of application of this type of finish. Hence, this digest of current information; to bring you up to date on the many ways in which you can obtain proper surface preparation for painting and increase product durability with a single multi-purpose chemical pretreatment. Report I on decorative, corrosion-resistant finishes and Report III on chemically polished, corrosion-resistant finishes are available on request.

First, it is an accepted fact that metal surfaces should be prepared before painting to make possible an efficient paint system. Naturally, this preparation should provide for good initial paint adhesion. Chemical treatments have proved extremely effective in this respect, particularly those of a neutral or preferably acid nature. Further, to be most efficient, chemical treatments should provide a non-porous barrier to maintain adhesion by sealing the metal from the paint and moisture. They should also provide a self-healing film which prevents lateral corrosion in the event that bare metal is exposed through scratching.

The Iridite chromate conversion coatings meet all these requirements. Iridite is a chemical conversion treatment for surface preparation. It provides initial paint bonding by molecular adhesion. It is acid in nature and produces a film that is gel-like and non-porous in structure. Thus, the Iridite film effectively seals the metal from the paint and from moisture penetration. Because the film contains certain relatively soluble constituents, it will protect areas scratched through to bare metal and prevent lateral corrosion. This is accomplished by a gradual leaching of these constituents into the damaged area.

Further, because of its gel-like, non-crystalline nature, the Iridite film will not affect the appearance or texture of the paint film, nor will it dust or powder to mar the painted surface. Because the film is non-porous, paint coverage is increased, thus substantial savings in paint costs will be realized. In addition, treated parts may be stored for long periods of time prior to painting without the risk of entrapped moisture causing blistering when painting.

Iridite chromate conversion coatings are widely used with equal ease and success under both baked and air-dried paint systems. While the actual adherence properties of the Iridite film do not increase appreciably with its thickness, corrosion protection does. The protection of the Iridite film is proportionate to its thickness and should be taken into consideration when selecting the Iridite to meet your needs. However, it is sometimes necessary to sacrifice maximum corrosion protection for appearance when a finished part is to be only partially painted. For example, it may be desirable to use a thin, clear, bright Iridite film if the unpainted areas must present a chrome-like appearance. A typical case is that of instrument housings on which the exterior is painted and the inside left unpainted.

On the other hand, if all surfaces of the product are to be painted and maximum corrosion protection is required, the heavier and most protective Iridite films should be used. For example, all surfaces of zinc die cast fruit juicers are finished with a highly protective Iridite film prior to painting to provide maximum resistance to the corrosive action of fruit juices.

Iridite finishes are now available for all commercial forms of the more commonly used non-ferrous metals, including zinc, cadmium, aluminum, magnesium, silver, copper, brass and bronze. In addition to providing an excellent base for paint, the Iridite films also have high decorative value when used as final finishes in themselves.

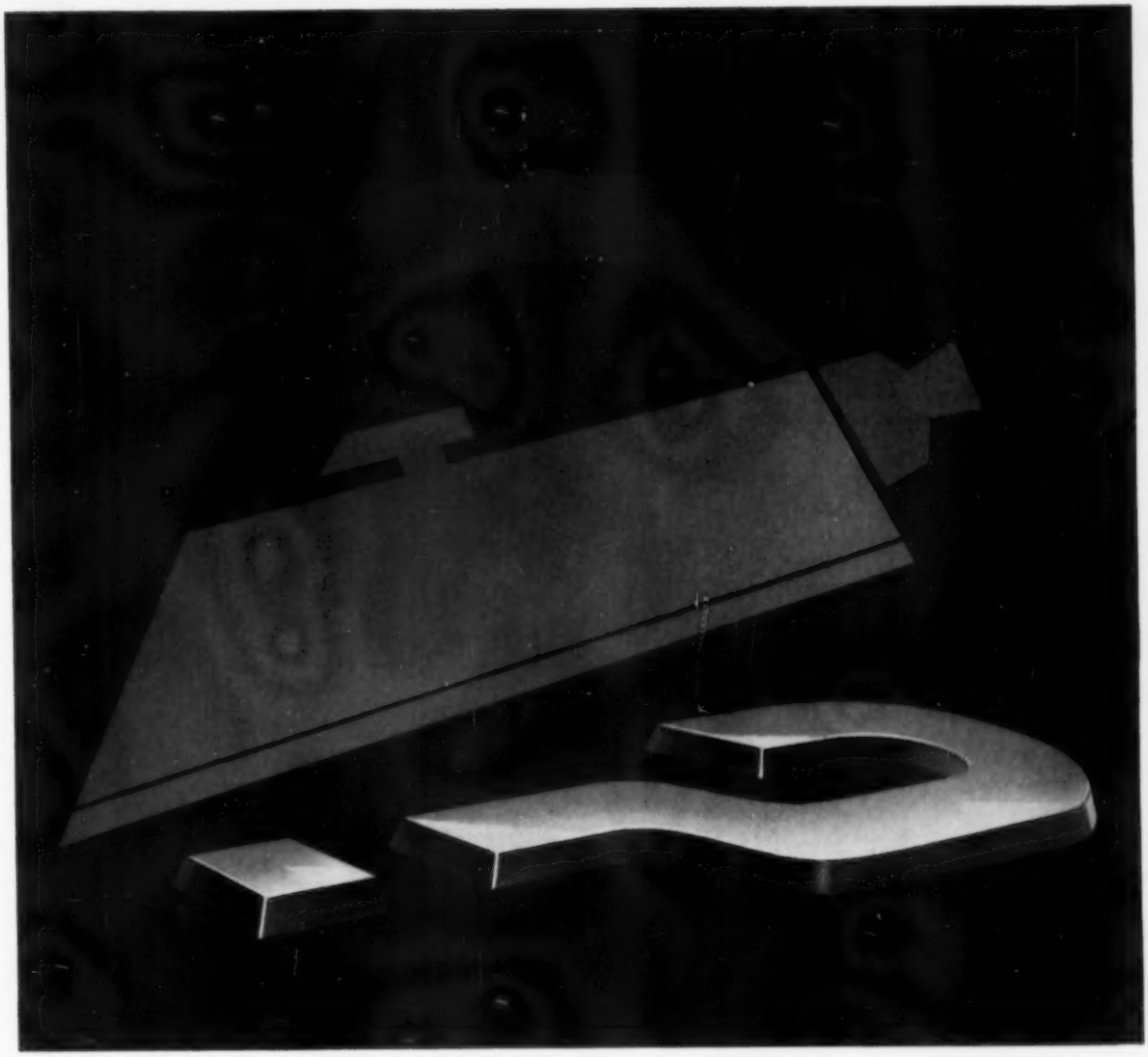
These films can produce a wide variety of pleasing appearances including clear bright, iridescent yellow, bronze, olive drab and brown. In addition, many films can be modified by bleaching or by dyeing. Among the dye colors available are various shades of red, yellow, green, blue or black.

In planning or designing, you should consider the many other characteristics of Iridite finishes which may enter into the specific problem. In addition to their functions as protective and decorative finishes, and as bases for organic finishes and bonding compounds, Iridites have low electrical resistance. Some can be soldered and welded. The film does not affect the dimensional stability of close tolerance parts.

Iridites are widely approved under both Armed Services and industrial specifications because of performance, low cost and savings of materials and equipment.

You can see then, that with the many factors to be considered, selection of the Iridite best suited to your product requires the services of a specialist. That's why Allied maintains a staff of competent Field Engineers—to help you select the Iridite to make your installation most efficient in improving the quality of your product. You'll find your Allied Field Engineer listed under "Plating Supplies" in your classified telephone book. Or, write direct and tell us your problem. Complete literature and data, as well as sample part processing, is available. Allied Research Products, Inc., 4004-06 East Monument Street, Baltimore 5, Maryland.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 716.



Iron out your chrome-plating problems with Diamond

Let DIAMOND's technical specialists go to work on your chrome-plating problems. These men work full time on customers' questions. They come up with complete, profit-making answers. Their service is free.

In producing chromic acid, DIAMOND controls *every* processing step to safeguard quality. DIAMOND experience starts with importing the chrome ore and making the soda ash, and extends through production and delivery. It even includes standing by your side, if you wish, to help you get top-quality plating results and keep costs low.

DIAMOND facilities—two chromic acid plants and nine warehouses and sales offices across the country—assure you uninterrupted supply and dependable service. DIAMOND ALKALI COMPANY, 300 Union Commerce Building, Cleveland 14, Ohio.

Diamond Chemicals

THE SHAPE OF THINGS TO CUT

PROGRESS IN BARREL FINISHING has been spectacular in recent years...thanks to high-precision tumbling machines and precision-engineered tumbling media. Along with this progress, CARBORUNDUM offers a complete line of tumbling media specifically designed with fully-controlled uniformity to meet the most precise customer requirements.

THE CORRECT TUMBLING ABRASIVE by CARBORUNDUM will save you time, slash your costs, and give you superior results in precision metal finishing...in deburring, scale removal, polishing, honing, blending. For information, ask your CARBORUNDUM distributor or write Electro Minerals Division, Dept. 83-612, The Carborundum Co., Niagara Falls, N.Y.

ELECTRO MINERALS DIVISION

The CARBORUNDUM Company

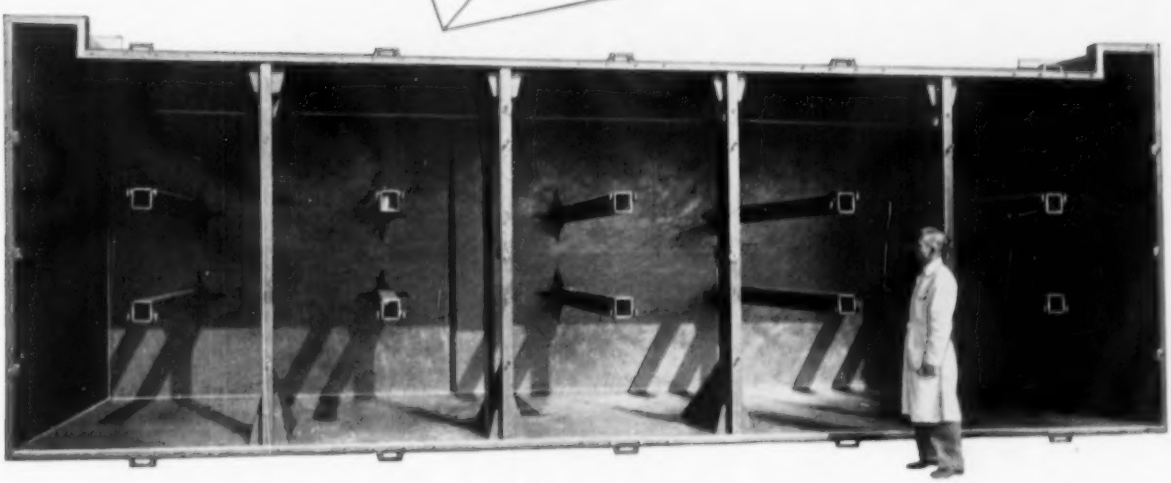
REGISTERED TRADE MARK

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 718.

MICCROSOL

SPRAY S-2003

helps *Udylite* break another size barrier!



30' x 9' x 9' 4" plating tank lined by Udylite with Miccrosol Spray S-2003.

Another size barrier in the coating industry was broken when this 11½-ton plating tank was lined with a 3/16"-3/8" coat of Miccrosol Spray S-2003. The combination of Udylite's efficient 31-foot oven and Miccrosol Spray S-2003 made it possible.

The tank was placed in the oven, coated by spraying, and then cured. When removed, the job was complete.

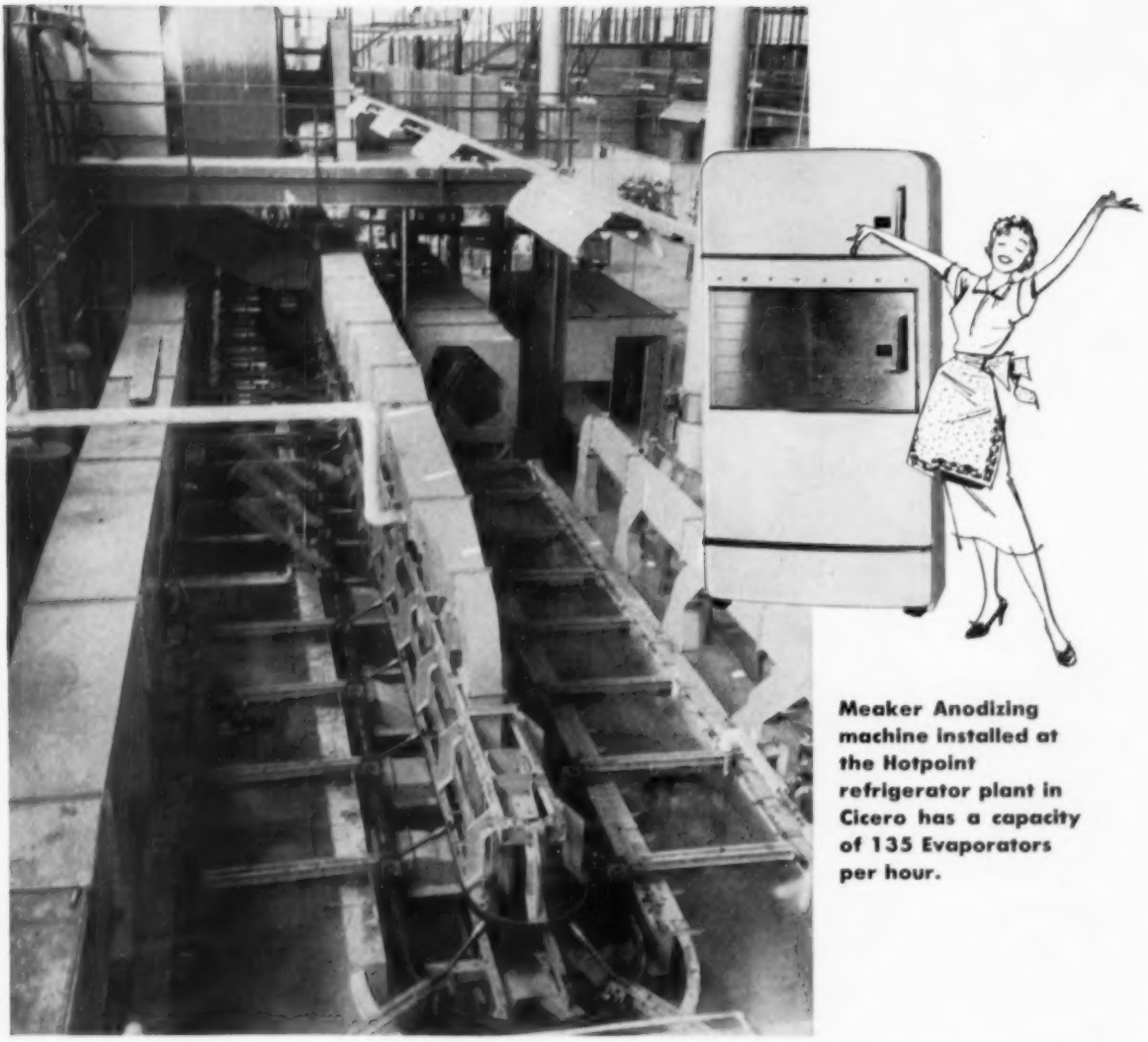
Miccrosol Spray S-2003 was selected by Udylite for this job both because it could be applied under these unusual conditions and for its outstanding performance as a lining for plating tanks. This material, combined with their facilities, enabled them to turn out a top quality coating job which heretofore would have been impossible.

Write for complete information on your company letterhead.

MICRO Products — *Developed and manufactured by experienced platers and coaters.*

MICHIGAN CHROME *and Chemical Company*

8615 GRINNELL AVENUE • DETROIT 13, MICHIGAN



Meaker Anodizing machine installed at the Hotpoint refrigerator plant in Cicero has a capacity of 135 Evaporators per hour.

MEAKER helps HOTPOINT meet new trend toward lighter Anodized Metals

Engineered and designed as an integral part of Hotpoint's production line, **this Meaker Anodizing machine is used for the complete anodizing process.** It was expressly developed to handle various components and difficult to drain refrigerator parts such as deep, box-like "evaporators." Carrier arms in this case were engineered to raise to a 30° angle assuring complete pour-out of liquid and eliminating the carryover of fluids from one tank to another.

Meaker engineers think like plant engineers and it's this kind of detailed thinking that has helped Hotpoint solve many other plating problems and produce a finer end product at the lowest possible cost. On your next metal finishing problem, call Meaker—**this experienced company can show you tomorrow's ideas for plating and processing.**

MEAKER
METAL FINISHING EQUIPMENT

for detailed information on Meaker equipment write for free Bulletins, c/o Dept. A.

The Meaker Company *1629 South 55th Avenue, Chicago 50, Illinois*

NICKEL WILL STRETCH

by CLEVELAND F. NIXON

DURING THE PAST FEW YEARS, General Motors has been trying to improve the durability of copper-nickel-chromium plated coatings on outside automobile parts and at the same time to become accustomed to the fact that there is a limited supply of nickel available for plating. At first glance, these two objectives seem incompatible. Certainly most of us have felt for years that durability is largely a function of plating thickness. Some, going further, feel that durability is mainly related to the thickness of the nickel plate. Can we then hope to improve quality and also to get along with no more or with even less nickel?

Briefly, the qualitative answer to this question is "Yes." First, it is thought, because there are significant although not well understood factors other than plating thickness that have an influence on out-of-door performance of decorative plating, and, second, because a considerable portion of the nickel consumed in the plating room is not gainfully used. In other words, we think our nickel supply will stretch.

Following the World War II years, when the use of nickel for decorative plating was prohibited, and the Korean War period, March 1, 1951, to November 1, 1953, when the use of nickel for civilian plating was restricted by government order, we have been competing with only moderate success with other industrial nickel users for the nickel available after stockpiling and military needs were satisfied.

There are a number of factors working in platers' favor this year that may relieve the situation somewhat. Nonetheless, in the opinion of some who have an intimate knowledge of the situation, every effort to conserve nickel should continue.

At the outset, it would seem desirable to establish the minimum thickness of nickel plating needed to insure good performance out of doors. When the basis metal is copper or brass, 0.003 in. of nickel, minimum, is universally considered satisfactory. When the basis metal is steel or zinc base alloy, there is, somewhat surprisingly, a difference of opinion which has not been resolved despite years of effort on the part of the group of important platers making up the American Society for Testing Materials Committee B-8 on Electrodeposited Coatings. This difference in thinking has to do mainly with the protective value conceded a layer of copper plating underlying the nickel.

* Research Staff, General Motors Corporation

ASTM Specification A166-55T, Type DS for severe exposure conditions, calls for 0.001 in. minimum nickel and 0.00125 minimum total thickness. The minimum nickel thickness required by General Motors specification for plating intended for out-of-door service, on the other hand, is 0.0006 in., while the corresponding minimum total thickness is 0.002 in. In both cases, the difference between total thickness and nickel plate thickness is the thickness of the copper plating. In our present context, this lack of agreement is significant; if the General Motors specification be accepted, then a theoretical 40 per cent saving in nickel has been made.

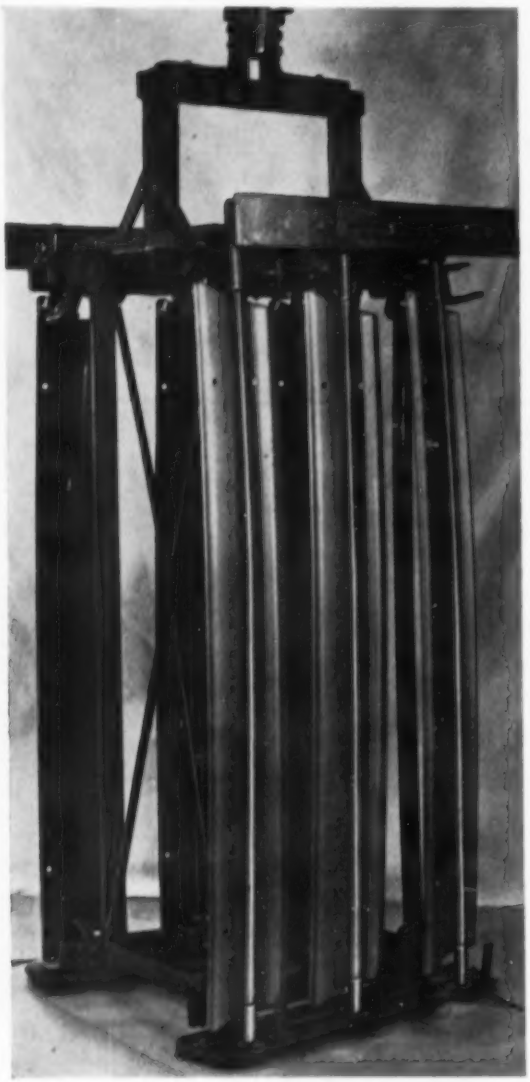


Fig. 1

If it is considered that neither specification is fully adequate—as must be done, since deposits which comply with either of the requirements do not always perform well in service—it does not follow that the only way to achieve improvement is to increase plating thickness. There are a number of other factors that have an influence on durability: (1) the nature of the basis metal and the mechanical and chemical preparation of the basis metal surface; (2) the chemical and physical properties of the deposit, influenced by the composition of the plating bath and its conditions of operation; and (3) postplating treatment, including not only heat treatment and organic coatings but also, if a silght extension of the term will be permitted, buffing and chromium plating.

Development in this area has been hampered by the lack of a suitable accelerated testing procedure. Despite many years of effort, ASTM Committee B-8 has been unable to reach a firm conclusion as to relative merit of the copper-nickel-chromium sequence and the nickel-chromium sequence, mainly because it has been necessary to await the results of out-of-door testing. It is this need that makes the work of the American Electroplaters' Society Research Project 15 on Accelerated Corrosion Testing so important. If either the acetic acid salt spray test or the Corrodkote test—the two tests now engaging most of the Project 15 Committee's time—can, it is hoped, be recommended for adoption during 1957, it will indeed be a banner year for the plater. Given a reliable accelerated test, then our individual efforts to improve durability without (necessarily) increasing plating thickness will have more meaning as will the direct and indirect work on the durability problem by a number of AES Research projects. Projects 2 and 5 on Impurities, Project 12 on "Cleaning and Preparation of Metals for Electroplating," Project 13 on the "Nature, Cause, and Effect of Porosity of Electrodeposits," Project 14 on "The Effect of Basis Metal on Electrodeposits," Project 16 on the "Mechanism of Plating," Project 17 on "Microthrowing Power," and Project 18 on the "Mechanical Finishing of Metal Surfaces" all will make better progress when Project 15's work is done.

General Motors has been proceeding on the assumption that acetic acid salt spray results are significant. Here are a few tentatively-held conclusions, derived from acetic acid salt spray test results.

1. There is often a considerable variation in results obtained when a number of like production pieces and even when a number of supposedly alike laboratory-prepared specimens are tested at the same time. Findings of this sort can only mean that the behavior of the testing medium is erratic or that there is a difference in the test pieces. Since, when sufficiently large test lots (ten to twelve pieces) are used, repeated tests in the same or in another properly controlled test box yield check results, it seems likely to us that the variable is in the test pieces. This conclusion leads inevitably to another: There must then be at least one presently unrecognized variable out of control.

2. The durability of unbuffed nickel (chromium plated) deposited on steel from a Watts nickel bath is not sig-

nificantly altered by variation in solution composition, temperature, *p*H, current density, or within ordinary limits, by agitation. However, a considerable increase in durability results when Watts nickel is buffed to a good luster before chromium plating.

3. Nickel deposited from an old-fashioned double salt bath at less than 5 amp/sq ft is about the same durability-wise as Watts nickel, after chromium plating. There, perhaps, goes another myth.

4. The brightening additives recommended by at least two suppliers improve corrosion resistance. Thickness for thickness, these bright nickels after chromium plating seem about equivalent to Watts nickel after buffing and chromium plating.

If experience teaches that acetic acid salt spray results (and/or Corrodkote test results) reliably predict out-of-door performance, then progress toward better plating will be rapid; the researcher will need to wait but days for his answers instead of months or even years. Accepting this assumption, it seems reasonable to feel that means to achieve improved durability with less nickel than is now specified will be found as our knowledge of influencing factors increases.

Fortunately it is not necessary to stand by idly while awaiting the acquisition of new knowledge however confidently we expect its coming. There are a number of known things that can be done now to save nickel without loss in the quality of finished products.

Racks can be designed and built to prevent gross overplating of some areas in order to achieve the required minimum plate in other areas of significance. In some cases, conforming and other special anodes can be used to good advantage. Depositing nickel can be avoided altogether in non-significant areas—or if this proves too expensive, at least reduce the amount of nickel deposited on areas where it is not needed. Plating racks can be kept in good repair so that they do not build up nickel trees for the scrap pile, and discontinue the use of robbers in favor of non-plating shields. Drag-out losses can be practically eliminated. Loss of nickel in solution in discarded sludges resulting from purification can be minimized.

The never ending war on plating rejects can be waged even more intensely. A good preventive maintenance program will help reduce losses due to stoppage of fully automatic equipment resulting from either mechanical failure of some machine component or to a jam-up of out-of-dimension plating racks.

Critical inspection of parts just before plating can reduce the number of pieces plated that are not good enough for use, while careful handling after plating can hold down losses due to scratches and other handling defects. Nickel originally deposited on parts which must be re-operated is waste nickel, whether it be stripped or simply overplated.

It is not intended, of course, to suggest that platers have been negligent. They have always striven for efficient, trouble-free operation. At the present time, however, in view of the cost of nickel and its relative unavailability, it is worthwhile to consider extraordinary measures to reduce wastage. If at the same time, as is often the case, quality is improved as nickel losses are decreased, the effort is doubly significant. Measures that would have been considered a short time ago to be visionary have become relatively commonplace.

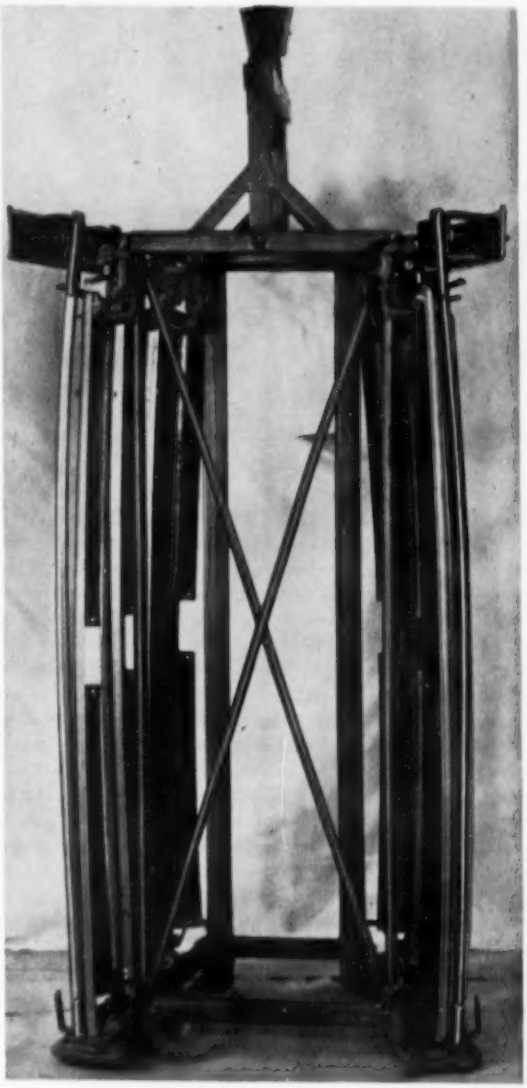


Fig. 2

For example:

At the Ternstedt Division's Trenton Plant, practically no nickel is lost by drag-out from five fully automatic plating machines handling together 675 racks per hour, each carrying on the average five square feet of work

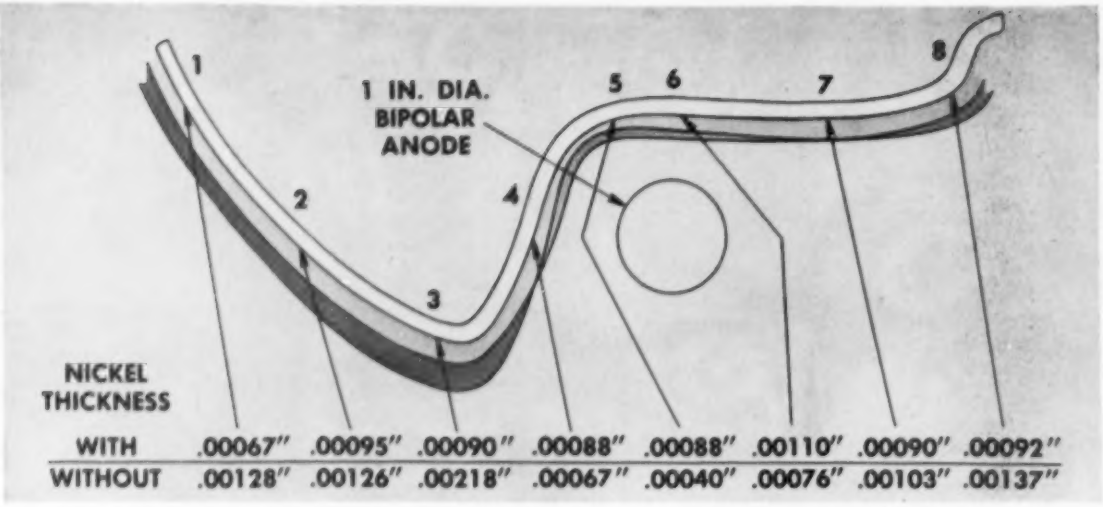


Fig. 3. Bumper center bar cross section showing nickel distribution greatly exaggerated with and without bipolar anode.

surface. The five machines hold a total of 45,000 gallons of nickel solution.

As a first step in this achievement, great care is exercised in positioning parts to be plated on plating racks to eliminate solution cupping. Second, racks emerging from the nickel plating solution are elevated to transfer position one station before the end of the tank is reached. After elevation, the loaded racks are rinsed over the tank with a fine water fog spray which is allowed to drain back into the nickel solution. Volume of water used for the fog spraying is regulated to match the evaporation rate of the nickel plating solution. Racks emerging from the save-rinse water tank following the plating tank are again water sprayed to remove last traces of plating solution. The only water entering this rinse tank is the spray water, regulated so that the rate of flow from the rinse tank is about 100 gal/hr. This overflow 100 gal is then passed through an ion exchange tower containing a cationic resin which removes nickel and, of course, other cations. In due time, the nickel collected by the resin is recovered by backwashing with a sulfuric acid solution. The solution containing recovered nickel sulfate, about 15 oz/gal, is used as required for solution make-up—after its *p*H has been adjusted to about 3.0 with nickel carbonate and after removal of precipitated calcium sulfate.

In at least one of the installations, three successive save-rinses are used instead of one. In this case, the spraying operation occurs only after the third water immersion; the excess water which cascades back into the first rinse tank is accumulated and treated as described. It is estimated that this recovery operation saves about 95 per cent of all drag-out nickel sulfate. For 1956, the total amount was about 20,000 pounds of nickel salts—or more than two tons of metallic nickel.

After three years of operation, it can be said with assurance that the system is successful. Impurities do not accumulate to disturb the plating operation even though only reclaimed nickel sulfate is used for solution maintenance. If anything, impurities tend to decrease.

The cost of the recovery operation is much more than offset by the value of the saved nickel sulfate.

Another example:

Auxiliary or bipolar electrodes are being used increasingly to accomplish a double-barrelled purpose—increase of nickel thickness in recessed areas and decrease of thickness in normally high current density areas. For instance, at Chevrolet Motor Division it is estimated that the overall amount of nickel required to plate the 1957 rear center bumper bar has been reduced nearly 50 per cent by this

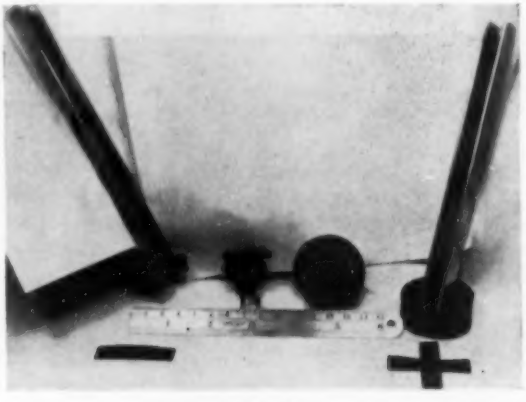


Fig. 4

means while at the same time quality has been improved, as measured by the acetic acid salt spray test.

Fig. 1 pictures a plating rack holding six of the 58½ in. long rear center bars with bipolar electrodes in place. The collector bar, the cathodic portion, near the top of the rack projects outward toward anodes located about six inches away. The anodic portion, made of wrought nickel, is at the start about one inch in diameter and is located about ¾ in. from its bumper part. This portion of the electrode, of course, dissolves; it lasts about a month in production use before replacement is necessary.

Fig. 2 is another view of the same rack.

Fig. 3 illustrates the effect on nickel plate distribution. Note that when the bipolar electrode is not used, thickness varies from a minimum of about 0.0004 in. in the area of lowest current density to well over 0.002 in. in the area of high current density and that when the bipolar electrode is used, the distribution pattern is significantly changed.

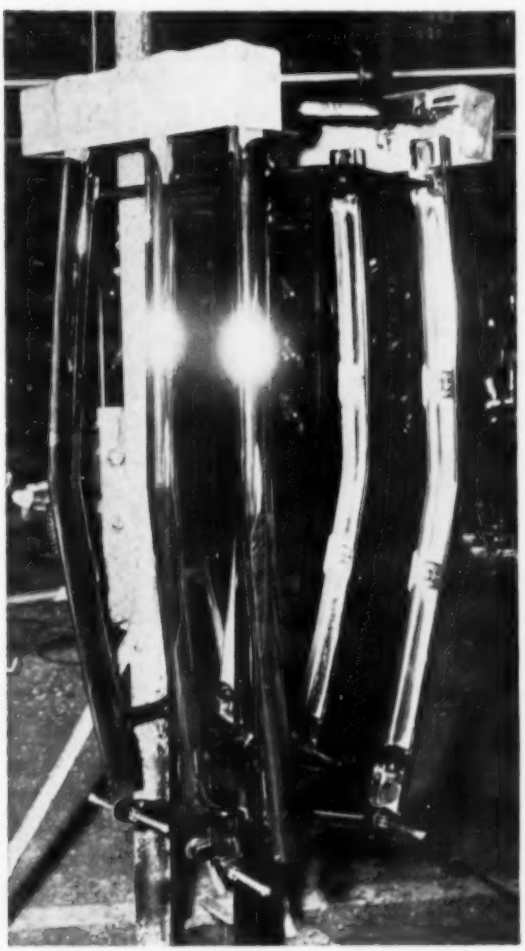


Fig. 5

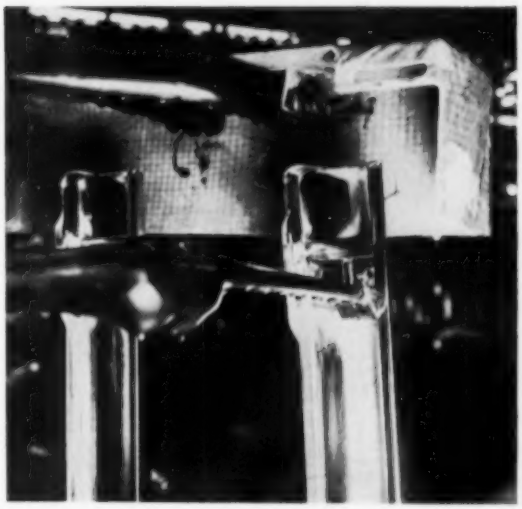


Fig. 6

The area having the thinnest plate, about 0.007 in., is now near the top of the piece, and the greatest thickness observed is but somewhat more than 0.001 in.—in this example, 0.0011 in. In other installations, the bipolar electrode is replaced with a more conventional auxiliary anode which usually draws its power from a separate power source. The resultant effect on plate distribution is the same.

Another example:

The use of robbers to prevent burning on areas of extremely high current density is gradually being discontinued in favor of non-conductive plastic shields. Without some protection, the ends of the U-shaped metal channels tend to build up heavily with nickel or to burn (see Fig. 4). In previous practice, a spring steel clip served as a robber. After continued use, these spring clips build up heavily with copper and nickel, eventually making it necessary to discard the clip and its burden of deposited metal, to be sold as scrap. Now, plastic cups serve the same purpose without wastage of nickel. This same shielding principle is being used in production even when the parts are much larger (see Figs. 5 and 6).

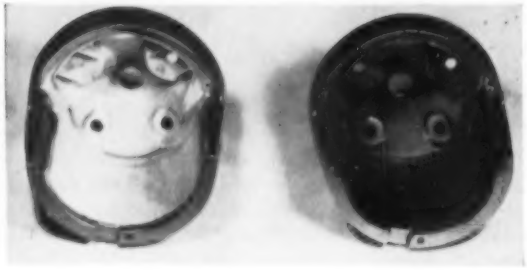
The ends, top and bottom, of Pontiac bumper bars were in past practice protected by robbers similar to those shown at the bottom end of pieces in our illustration. They are being replaced by plastic shields as shown guarding the top end of the bumper. The saving of nickel is substantial.

A final example:

One of the advantages of the die casting process is that it makes possible the combination of several components into one piece. This, plus the fact that complicated shapes are relatively easy to achieve, is one important reason for

Fig. 7
(at left)

Fig. 8
(below)



the growth of the die casting industry. But when it becomes desirable to apply a decorative plating to a small portion of a die cast piece, it has been a practical necessity to plate the entire piece. A result is that much more nickel than is necessary to the job is consumed. One way to save the nickel ordinarily deposited on non-significant surfaces of such a piece is to protect them with a suitable stop-off material. Literally scores of materials have been examined by our Guide Lamp Division, in search of one that would serve the stop-off purpose and still remain in good condition after buffing, cleaning, and plating so that it need not be removed prior to shipment. A few have been found that are satisfactory. Production quantities of parts such as the lamp body pictured in Figs. 7 and 8 have been processed in this manner. The saving in nickel in this particular case may be well over 75 per cent. This manner of saving nickel is dependent upon cost and, of course, on customer acceptance. An alternate to this plan is to redesign parts to create two or more separate pieces instead of the original one—with no change, of course, in styling or functional concept—in which case only those pieces which need plating will receive it. Increasing attention is being given to this production engineering phase of the over-all problem of conserving nickel.

When all of the factors discussed are taken into account, it does not seem unreasonable to feel that we can get along with less nickel without loss in quality if we work at it. This paper has not even touched upon the possibility of saving nickel by elimination of nickel plating, either through change in basis metal to some other, such as stainless steel or aluminum, or by the development of a durable substitute for nickel in our decorative plating systems. So far, it must be admitted that we have not been particularly successful in this latter effort; but the idea has not yet been given up as impossible.

By and large, one should feel grateful rather than otherwise that the business of plating is growing increasingly complicated. One learns faster under pressure. We will, it is thought, learn how to improve quality and at the same time how to stretch the nickel supply.

ACKNOWLEDGMENT

It is a pleasure to acknowledge the help received from the many people in the General Motors organization in gathering the information contained in this paper. Special acknowledgment for information contained in the nickel conservation examples and illustrations is made to T. J. Fadgen, Ternstedt Division, Trenton, New Jersey; T. J. Doyle, Pontiac Motor Division, Pontiac, Michigan; Denton Kunze, Chevrolet-Detroit Forge Division, Detroit, Michigan; Henry D. Nagel, Spring and Bumper Plant, Chevrolet Motor Division, Livonia, Michigan; and F. Brower, Guide Lamp Division, Anderson, Indiana.

Cleveland F. Nixon was born in Philadelphia, Pa., on May 4, 1901. In 1919, he entered the University of Wisconsin where he became interested in electroplating through the influence of his professor in electrochemistry, Dr. Oliver P. Watts. Graduation with a BS degree in Chemical Engineering was followed by a six-year stint in the laboratory of the Western Clock Co. in Peru, Illinois. In 1929, he joined the Ternstedt Division of the General Motors Corp. as plating engineer. Later, as director of Process Engineering and Laboratories and then as director of the Process Development Section, he was concerned with plating engineering, finishing with organic materials, die casting, and product and material testing. In January 1952, he was transferred to the Research Laboratories (now known as Research Staff) of the General Motors Corp. to head of the Electro-Chemistry Department.

Mr. Nixon is an active member of the American Society for Testing Materials, the Society of Automotive Engineers, and the AES of which he was president in 1951–52.

AES Research Project No. 15

Accelerated Corrosion Tests for the Performance of Plated Coatings

Fourth Progress Report

by Walter L. Pinner

W. L. PINNER
Project Chairman

THE PURPOSE OF THIS REPORT is to present tentative procedures for the conduct of two accelerated methods for testing the out-of-door durability of chromium plated steel and zinc alloy parts.

The two tests to be defined are the Acetic Acid Salt Spray Test and the Corrodkote Test. Work to date on both indicates, first, that the kind of corrosion failure that develops closely parallels that which develops in out-of-door service; and, second, that there is a relationship, as yet but partially defined, between time required to produce failure in test and time required to produce failure in a given out-of-door environment. Both tests have been proven moderately reproducible by repeat tests in the same laboratory and, more importantly, by parallel tests in different laboratories. As may be expected, however, since both tests are empirical in nature, it is proving essential that test conditions be controlled quite closely.

Inasmuch as the work of the Committee is continuing, the procedures presented below are not considered final. Changes from time to time may become desirable. In fact, the Committee is now considering a modification of the Acetic Acid Salt Spray Test which involves the addition of a copper salt. Such an addition appreciably accelerates the test. Increase in temperature further accelerates the test.

The Corrodkote Test and the Acetic Salt Spray Test have proven useful for plant control of production quality and in evaluating changes in plating practice. However, the Committee is not prepared to recommend acceptance standards based on either. More experience, particularly with regard to correlation with out-of-door service, is needed, preliminary to establishment of acceptance limits.

Two methods of judging are under consideration:

1. Number of test hours before basis metal corrosion begins.
2. Course of development and extent of corrosion after a fixed period of test.

Obviously, the better the parts withstand test environment with little or no corrosion the more durable they are considered to be.

Attempts to correlate results of either new test with results obtained in the neutral salt spray test have proven futile and even misleading partly because of the erratic behavior of the neutral salt spray test and partly because of greater severity of attack encountered in the new tests.

The Committee will be pleased to

receive reports and criticism from all who work with these new test procedures.

THE ACETIC ACID SALT SPRAY TEST

Procedure Prepared by General Motors Corporation

The Acetic Acid Salt Spray Test is covered in detail in the 1955 ASTM Book of Standards, ASTM Designation B287-54T, Part 2, pages 879–885. The following cautionary and modifying notes derive from Project 15 Committee experience. Some of them have already been approved by ASTM's Committee B-3 and so will appear in the next printing of B287.

1. The box should be lined with or constructed of nonmetallic material not subject to leaching of any of its components by acetic acid solution. All piping and nozzles should be nonmetallic—methyl methacrylate plastic is preferred; hard rubber is acceptable.

2. The fog collection rate preferably should be between one and two milliliters per hour per 80 square centimeters. Since atomizer nozzles are subject to clogging, they must be inspected frequently and cleaned as required. Filtration of the salt solution minimizes difficulty of this kind.

3. The bubble tower should be kept clean and well filled. A water level control device will help here. The tower should be drained and refilled at least weekly so that impurities do not accumulate.

4. Exhaust conditions can be important. The drain must be kept closed or trapped so that no air (fog) can escape through it. The exhaust shall not be led into a vacuum line nor should it be subject to back-pressure in excess of ½ in. water. Draft control may be required in some installations. Difficulty in maintaining the desired test fog has been experienced when the exhaust pipe has been more than two feet long or has had a vertical component of more than one foot in length. Where such treatment is needed, it may be necessary to separate the exhaust from the outlet of the box sufficiently (4 in.) to insure that there shall be no suction.

5. In operation of the test, a *p*H as close to 3.2 as possible should be maintained. In water meeting the requirements of ASTM B287-54T, about one per cent of 36 per cent acetic acid solution or one-half per cent glacial acetic acid will suffice. Experience will soon determine the correct amount of acid required for a given combination of water supply and grade of salt. Until more is known about such solutions, the use of sodium hydroxide to raise *p*H should be avoided.

   If the *p*H of condensate which accumulates in the rate measuring cylinder varies more than 0.2 *p*H unit from the initial *p*H of the solution, the box is not operating properly. The cause for the change should be sought and corrective steps taken.

6. For critical work, test specimens should be cleaned with a thin paste of magnesium oxide. Significant surfaces are clean when free of water-breaks.

7. For critical work, exposures should be kept within the central two-thirds of the box and test pieces should be racked so that the significant surface, or as much of it as possible, is inclined 20 ± 2 degrees from the vertical. In general, the most severe attack occurs on surfaces inclined from 15 to 30 degrees from the vertical.

8. When specimens are exposed arbitrarily for a period of eight days and inspected after each 24-hr period, then a Performance Index number useful in judging relative corrosion resistance can be developed in the following manner. First assign a rating number, from "1" to "5," after each inspection in accordance with the schedule below:

Rating Number	Extent of Failure
5	No basis metal failure
4	0— 10% of area
3	10— 30% of area
2	30— 70% of area
1	70—100% of area

The percentage figures refer to the total significant area under test which appears affected by basis metal corrosion. Corrosion products which spread from a corrosion site should be ignored. It will help if cut edges and other known defects are masked. Assignment of rating numbers calls for judgment but is not often difficult given some experience. As an aid to estimation of area affected, it may be desirable to arbitrarily divide the total significant test area into a number of smaller areas of such size that they may be classified good or bad, depending upon the presence of one or more corrosion defects. The number of small areas failed may be compared with the total number of small areas, readily yielding a percentage area figure to be used in assigning the rating number. When ratings for each of eight inspection intervals have accumulated, a Performance Index number may be calculated by summing the ratings and multiplying by 2½; thus, a part unaffected in a 192-hr exposure (rated "5" for eight intervals) would have a Performance Index number of 100. Similarly, a part rated "1" at 24-hr and, of course, "1" for every subsequent inspection interval would have a Performance Index number of 20. One hundred is the maximum Performance Index number and 20 is the minimum.

   Sometimes the electrodeposit loses appearance value due to the formation of cracks or pits or accumulation of electrodeposit corrosion products. These developments should be noted but not confused with basis metal corrosion.

9. The copper salt modification of the Acetic Acid Salt Spray Test is accomplished by adding 1.1 gs of copper chloride ($CuCl_2.2H_2O$) per gallon of salt solution. With this addition and with the elevation of test temperature to $120\ ^{+2}_{-1}$ F (bubble tower temperature 130 to 135 F), the rate of attack is speeded up in the order of four to six times. Since this variant is relatively new, experience with its use is limited. There is some indication that corrosion acceleration for plated zinc base die castings is somewhat greater than for plated steel parts.

THE CORRODKOTE TEST

Procedure Prepared by Chrysler Corporation—Engineering Division

Reagents and Equipment

Cupric Nitrate—reagent grade
Ferric Chloride—reagent grade
Ammonium Chloride—reagent grade
Florida Kaolin—ceramic type
Distilled Water
Graduate Cylinder—50 ml
Volumetric Flasks—500 ml, glass-stoppered
Glass Stirring Rods
Glass Beaker—250 ml
Paint Brushes—1 inch
Analytical Balance
Humidity Cabinet—at 100 F and 90–100 per cent relative humidity with no condensation
Humidity Cabinet—at 100 F and 100 per cent relative humidity with condensation
or
Salt Spray Chamber

Procedure	Explanation	Precaution
A—Preparation of Reagents		
1—Weigh out exactly 2.50 g cupric nitrate—$Cu(NO_3)_2.3H_2O$—and dilute with distilled water to exactly 500 ml in a volumetric flask.	1—This solution is used as the basic cupric nitrate reagent.	
2—Weigh out exactly 2.50 g ferric chloride—$FeCl_3.6H_2O$—and dilute with distilled water to exactly 500 ml in a volumetric flask.	2—This is the basic ferric chloride reagent.	2—This reagent may be kept for two weeks only.
3—Weigh out exactly 50.0 g ammonium chloride—NH_4Cl—and dilute with distilled water to exactly 500 ml in a volumetric flask.	3—This is the basic ammonium chloride reagent.	
B—Preparation of Corrodkote Slurry		
1—Measure out exactly 7.0 ml cupric nitrate reagent and place it in a 250 ml glass beaker.	1—This is equivalent to 0.035 g $Cu(NO_3)_2.3H_2O$, the amount used in one batch of Corrodkote, and will cover approximately 30 sq ft.	1—Make up a fresh batch of the Corrodkote slurry each day.
2—Measure out exactly 33.0 ml ferric chloride reagent and place it in the beaker with the 7 ml cupric nitrate.	2—This amount is equivalent to 0.165 g $FeCl_3.6H_2O$.	
3—Measure out exactly 10.0 ml ammonium chloride and place it in the beaker with the 7 ml cupric nitrate and 33 ml ferric chloride.	3—This amount is equivalent to 1.0 g NH_4Cl.	
4—Weigh out 30 g Kaolin and add it to the reagents in the beaker.		
5—Mix the ingredients in the beaker thoroughly with a glass stirring rod until a homogeneous slurry is obtained.	5—Mixing time is about two minutes.	5—Use glass stirring rod only. The Corrodkote slurry will attack metal.
C—Testing of Parts		
1—Dip a dry brush in the slurry and, with circular motions, completely cover the part to be tested.		1—Be sure the whole surface is completely wetted.
2—Smooth the coating with brush strokes in one direction.	2—This action will effect a uniform coating.	2—Afterwards, clean the brush with running water so that it can be used again.
3—Allow the coating to dry for one hour.		
4—Place the part in the non-condensing humidity cabinet.	4—High humidity will accelerate corrosion.	4—Do not remove any of the Corrodkote during handling.
5—After twenty hours remove the part from the humidity cabinet.		

(Continued on next page)

Procedure	Explanation	Precaution
6—For *zinc die castings:* Clean off the Corrodkote with running water and a sponge, dry, and inspect.	6—To facilitate cleaning and inspection a mild abrasive, such as Tripoli, may be used.	
7—For *steel parts:* Count the number of rust spots before cleaning the part, then clean with running water and a sponge.	7—Most of the rust will be removed when the Corrodkote is removed. It will then be very difficult to determine which spots are surface pits and which are pinhole rusting.	
8—Place the steel parts in the condensing humidity cabinet for twenty-four hours, or in the salt spray cabinet for four hours, and re-inspect.	8—High humidity or salt spray will bring out the rust spots again.	
9—Record condition of plated surface.		

Caution: The Corrodkote procedure as outlined does not involve any kind of precleaning of the plated parts. While other means of applying the Corrodkote paste as, for example, by spraying may be a satisfactory procedure, it is recommended that the brush method which is defined should be used. The humidity cabinet for the twenty-hour exposure must be operated so that it is completely non-condensing. It has been found that if condensation occurs, the Corrodkote paste may be made more corrosive, or if condensation is severe enough, the paste may be washed off of the part. Either occurrence would give a false result. Correct conditions can be maintained by equipping the cabinet with a fan directed so as to circulate air over a pool of water.

Changes in the Committee membership have occurred since the time of our previous listing. There is appended the present list of Committee members together with their companies without whose contributions the project could not possibly have attained its present status. It is appropriate to express on behalf of the Committee our gratitude to these companies and to the individuals who have contributed so greatly to this project.

This particular report has been prepared by a task group selected from the Committee, consisting of Messrs. Nixon, Bigge, and Saltonstall and whose assistance is gratefully acknowledged. This report is submitted on behalf of the Committee by its chairman.

PROJECT 15 COMMITTEE MEMBERS

Name	Representing
D. M. Bigge	Chrysler Corporation
M. R. Caldwell	Doehler-Jarvis Corporation
M. B. Diggin	Hanson-Van Winkle-Munning Company
C. O. Durbin	Chrysler Corporation
J. E. Fritts	Ternstedt Division, General Motors Corporation
J. T. Irwin	Promat Division, Poor & Company
B. Martin	McGean Chemical Company
W. D. McMaster	General Motors Corporation, Research Staff
R. D. Miller	Electric Auto-Lite Company
C. F. Nixon	General Motors Corporation, Research Staff
F. E. Olmstead	Utica Bend Corporation, Subsidiary of Curtis-Wright Corporation
W. J. Pierce	Harshaw Chemical Company
W. L. Pinner (Chairman)	Houdaille Industries, Incorporated
C. H. Sample	International Nickel Company, Incorporated
R. B. Saltonstall	The Udylite Corporation
R. E. Shaw	Standard Steel Spring Division, Rockwell Spring & Axle Company
J. E. Stareck	Metal & Thermit Corporation
B. E. Tiffany	Ford Motor Company
R. D. Wysong	Studebaker-Packard Corporation

INDICATE B 701 ➤

LEA SATIN FINISH

...in modern lamp fashions by LIGHTOLIER

it's a finish that's

functional, fashionable, economical

As modern as tomorrow . . . this lamp from Lightolier's Fleetwood Collection created by Gerald Thurston, engineered by Lightolier, and the trim satin finished with Lea Compound. Lightolier says this LEA Satin Chrome Finish was chosen because it's modern, it harmonizes with other finishes and it's extremely durable. And we might add that it's a finish that's economical to produce.

Why not go modern on your finishing line? Why not try a Lea Satin Finish on your product? It will look terrific, it will have real consumer appeal and it will reduce your finishing costs.

Write or call us for an answer to your finishing questions.

Burring, Buffing, Polishing, Lapping, Plating and Spray Finishing . . . Manufacturers and Specialists in the Development of Production Methods, Equipment and Compositions. Manufacturers of Lea Compound and Learok . . . Industry's quality buffing and polishing compounds for over 30 years.

LEA®

The Hallmark of Quality Products

THE LEA MANUFACTURING CO.

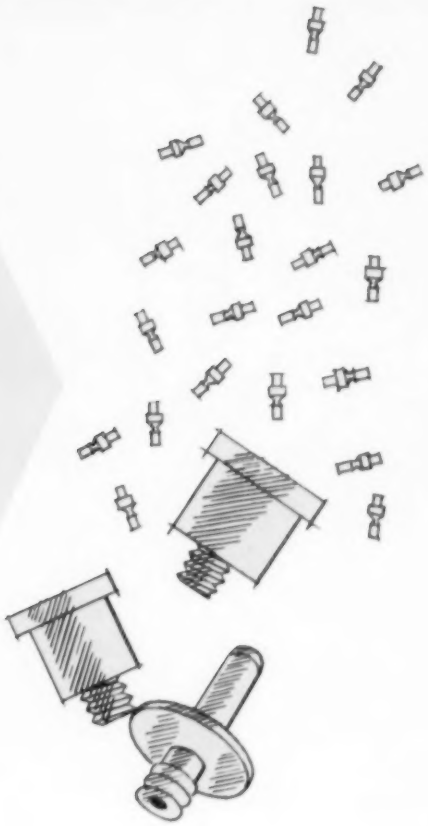
16 CHERRY AVE., WATERBURY 20, CONN.

Lea-Michigan, Inc., 14066 Stansbury Ave., Detroit 27, Mich.
Lea Mfg. Company of Canada, Ltd., 1236 Birchmount Road Scarborough, Ontario, Canada
Lea Mfg. Company of England, Ltd., Buxton, England
Lea-Ronal, Inc., Main Office and Laboratory: 139-20 109th Ave., Jamaica 35, N. Y.
Manufacturing Plant: 237 East Aurora St., Waterbury 20, Conn.

Are you interested in Plating Specialties? **SEE THE OTHER SIDE OF THIS INSERT.**

SILVER-GLO/GOLDEN-GLO

Mean trouble-free industrial silver and gold plating



If your parts require bright silver or bright gold, either separately or in combination AND you desire simplified trouble-free operation you should be using

SILVER-GLO 3K

- Silver deposits are harder, more wear resistant and tarnish resistant than conventional silver.
- Plated work is free rinsing, no film, no water breaks, only a simple water rinse prior to subsequent gold or rhodium deposits.
- High speed bright deposits are obtained.
- Simple maintenance of solution insures trouble-free operation.

GOLDEN-GLO MS

- Solution simple to operate and control; no complex filtration system; no current manipulation cycles.
- Deposits of gold MS over Silver-Glo 3K give excellent adhesion, hardness, brightness, and corrosion protection.
- Low initial make up cost of the MS process requires ½ gold concentration of other processes without sacrificing current density characteristics.

These two are well-proved, highly successful plating formulations, backed by many years' experience in serving the plating industry. Present solutions can be converted.

Write or call us about your problems and requirements, not only on silver or gold but on all other plating formulations and applications, such as nickel, copper, bronze, zinc, etc.

The
LEA GROUP
serving the Finishing Field

Lea-Ronal, Inc., Jamaica, N. Y.
Lea-Michigan, Inc., Detroit
The Lea Mfg. Co., Waterbury, Conn.
Lea Mfg. Co., of Canada, Ltd.
Lea Mfg. Co., of England, Ltd.

Plating Polishing Buffing Burring

Are you interested in Buffing, Polishing and Burring Specialties?

Lea-Ronal *Inc.*

Main Office and Laboratory:
139-20 109th Avenue, Jamaica 35, N. Y.
Manufacturing Plant:
237 East Aurora Street, Waterbury 20, Conn.

SEE THE OTHER SIDE OF THIS INSERT.

William Blum

SUMMARIES OF COMPLETED A E S RESEARCH PROJECTS

Abner Brenner

W. P. Barrows

The May issue carried a well-received omnibus highlighting AES Research Projects to date. To make those data even more complete, the following are published by request.

Gerald A. Lux

THROWING POWER IN CHROMIUM PLATING

(Concluded 1929)

Associates—

H. L. FARBER and W. BLUM

National Bureau of Standards

GENERAL PRINCIPLES SHOW that in the chromic acid baths used for plating there is little hope of radically improving the "throwing power." The purpose of this investigation was to define those operating conditions which yield the highest throwing power, which at best is poor.

The conclusions were:

1. Throwing power in chromium plating is determined almost entirely by the relative cathode efficiencies at the maximum and minimum current densities. An improvement in throwing power can be effected by any means which makes these efficiencies more nearly equal.

2. An increase in temperature lowers the throwing power. (See 4.)

3. An increase in current density raises the throwing power.

4. By increasing both the temperature and the current density the throwing power is made greater than at lower temperatures and current densities. As the range of bright deposits is wider at high temperatures, these conditions are the most favorable. However, if the available voltage is limited to about 6 v, an intermediate temperature and current density will yield best results.

5. For a given current density, better throwing power is obtained in dilute than in concentrated chromic acid solutions. If the available voltage is low, better throwing power is obtained in the more concentrated baths.

6. A ratio of $\frac{CrO_3}{SO_4} =$ 200 yields better throwing power than a ratio of 100 and very much better than a ratio of 50.

7. Large additions of sodium dichromate to a solution with a sulfate ratio of 100 slightly increase the throwing power, probably by changing the effective sulfate ratio. If the latter is initially 200, sodium dichromate is detrimental.

8. Boric acid has no measurable effect on the throwing power.

9. Small concentrations of trivalent chromium have no effect. Large concentrations slightly improve the throwing power, making it equal to that in a more dilute solution. As the trivalent chromium reduces the conductivity and the plating range, it is not a desirable constituent.

10. Iron has almost exactly the same effects on throwing power as trivalent chromium, but has a greater detrimental effect on the conductivity and plating range.

11. The throwing power is much better on highly polished than on dull metal. On sand-blasted metal it is very poor.

12. The throwing power is slightly better on steel and brass than on copper and nickel.

13. The covering power as determined with a bent cathode is practically parallel to the measured throwing power.

14. The best throwing power (−13 per cent) with bright deposits was obtained in a solution containing 250 g/l (33 oz/gal) of CrO_3, 1.25 g/l (0.17 oz/gal) of SO_4, at a temperature of 55 C (131 F) and an average current density of 35 amp/dm² (325 amp/ft²).

15. When the voltage is limited to only 5 v at the tank, a fair throwing power (about −60 per cent) can be obtained with 400 g/l (55 oz/gal) of CrO_3 and 2 g/l (0.27 oz/gal) of SO_4, at a temperature of 45 C (113 F) and an average current density of 15 amp/dm² (140 amp/ft²).

16. In the latter solution, at a temperature of 35 C (95 F) and an average current density of 7.5 amp/dm² (70 amp/ft²) a throwing power of about −60 per cent is also obtained. This is usually satisfactory if the articles are not of very irregular shape or are favorably placed in the tank.

REFERENCE

Research Paper No. 131; J. Research Nat. Bur. Standards, 4, 27 (1930).

◀ INDICATE B 702.

THE POROSITY OF ELECTROPLATED CHROMIUM COATINGS

(Concluded 1931)

Associates—

W. BLUM, W. P. BARROWS
A. BRENNER

National Bureau of Standards

VARIOUS METHODS FOR DETECTING porosity of chromium coatings were found to yield consistent results.

The well-known copper deposition method for detecting the porosity depends upon the fact that copper will deposit only in pores or cracks and not on the chromium. This test was made semiquantitative by measuring either the average apparent current density or the weight of copper deposited in two minutes at 0.2 v.

The following conclusions are based on such measurements:

1. The porosity, and especially the cracking of the chromium coatings, increase rapidly during the first 24 hours' standing, and more slowly for the following few weeks.

2. If the deposits are heated to 200 C (392 F) for a short time, the cracking is much more pronounced than on specimens aged at room temperature.

3. The porosity of thin coatings is slightly decreased by an increase in the content of chromic acid.

4. The porosity of thin coatings is slightly decreased by an increase in the CrO_3/SO_4 ratio to the maximum value that will yield bright deposits.

5. Chromium deposits produced at or below 45 C (113 F) show a marked minimum in porosity at a thickness of about 0.5 μ (0.00002 in.).

6. Deposits produced at higher temperatures, such as 55 or 65 C (131 or 140 F), have a lower minimum porosity, and the porosity does not increase greatly as the thickness is increased.

7. At any given temperature the porosity is increased by an increase in current density.

8. Under the conditions of plating now commonly used, the porosity is least when the chromium is deposited on nickel and greatest on steel.

REFERENCE

Research Paper No. 368; J. Research Nat. Bur. Standards, 7, 697 (1931).

PROTECTIVE VALUE OF NICKEL AND CHROMIUM PLATING ON STEEL

(Concluded 1934)

Associates—

WILLIAM BLUM, PAUL W. STRAUSSER
and ABNER BRENNER

National Bureau of Standards

PLATED, LOW CARBON, cold rolled steel panels were exposed for about two years at Key West, New York City, Pittsburgh, Sandy Hook, Penn. State College and Washington, D. C. The cleaning cycle was uniform except that there were three types of acid treatment: simple immersion, cathodic and anodic. In addition to variations in deposit thickness, there were four different nickel solution conditions and other variables involving copper, zinc and cadmium as intermediate deposits, and chromium.

The important conclusions of this investigation are:

1. The protective value of nickel coatings depends almost entirely on their thickness. At least 0.0005 in. (0.013 mm) is required for good protection under mild conditions, and at least 0.001 in. (0.025 mm) for severe conditions.

2. The conditions of nickel deposition and of the cleaning and pickling have no marked effects on the protective value.

3. The presence of a layer of copper reduces the protective value of thin nickel deposits under all conditions, and of thick deposits under severe conditions. If chromium is also present, the copper has very little harmful effect in thick deposits. If the copper layer is buffed, the protective value of the composite coating is increased.

4. A very thin deposit of chromium, such as 0.00001 in. (0.00025 mm), sometimes reduces the protective value, especially of pure nickel deposits. Chromium coatings about 0.00002 to 0.00003 in. (0.0005 to 0.0008 mm) add very little to the protective value, but maintain their bright appearance owing to their resistance to tarnish. Relatively thick chromium coatings, from 0.00005 to 0.0001 in. (0.0013 to 0.0025 mm), improve the protection against corrosion, especially in an industrial atmosphere.

5. The protective value of chromium over nickel or composite coatings is somewhat improved by using a bath with a high ratio,

$$\frac{\text{g/l } CrO_3}{\text{g/l } SO_4}$$

such as 200. Deposits produced at 35 C (95 F) are slightly superior to those made at somewhat higher temperatures.

6. The use of zinc under nickel makes the protective value less than that of either metal alone. Cadmium has very little effect under nickel.

7. The use of zinc or cadmium under nickel tends to produce white stains and blisters.

REFERENCE

Research Paper No. 712; J. Research Nat. Bur. Standards, 13, 331 (1934).

ACCELERATED TESTS OF NICKEL AND CHROMIUM PLATING ON STEEL

(Concluded 1934)

Associates—

P. W. STRAUSSER, ABNER BRENNER and WILLIAM BLUM

National Bureau of Standards

BOTH THE SALT SPRAY and intermittent immersion tests are useful for determining the relative quality, and especially the porosity, of coatings consisting of copper, nickel, and chromium. The results are more significant and more closely related to those of atmospheric exposure if the number and size of the rust spots at the end of a specified period, such as 100 hours, are recorded, rather than the time for the first appearance of rust. These methods do not, however, closely reproduce the types of corrosion produced in the atmosphere, and do not serve to detect small differences in protective value. The ferroxyl test is a rapid, reliable method for determining the relative porosity of the coatings.

REFERENCE

Research Paper No. 724; J. Research Nat. Bur. Standards, 13, 519 (1934).

AES Proc. 1939, 194.

CORROSION-PROTECTIVE VALUE OF ELECTRODEPOSITED ZINC AND CADMIUM COATINGS ON STEEL

(Concluded 1935)

Associates—

WILLIAM BLUM, P. W. STRAUSSER and ABNER BRENNER

National Bureau of Standards

ATMOSPHERIC EXPOSURE in six locations and accelerated tests, of plated specimens, led to the following conclusions:

1. Thin coatings of either zinc or cadmium furnish better protection against corrosion of steel in most normal climates than do equally thin coatings of nickel or chromium.

2. In uncontaminated marine or rural atmospheres either zinc or cadmium coatings with a minimum thickness of 0.0005 in. furnish protection against corrosion for at least a few years.

   In mild locations such as State College or Washington coatings of cadmium failed somewhat sooner than those for zinc. In marine locations the difference is not significant. The corrosion products of the zinc remaining on the coatings are more voluminous than those for cadmium.

3. In industrial locations both zinc and cadmium coatings fail in a comparatively short time. (Most of the following conclusions regarding atmospheric exposure are based on industrial exposure.)

4. In an industrial atmosphere cadmium coatings fail in from 65 to 75 per cent of the time that is required for failure of zinc coatings of the same thickness.

5. In an industrial atmosphere alloy deposits that contain about 10 per cent of cadmium and 90 per cent of zinc have a slightly longer life than zinc and considerably longer than cadmium deposits.

6. In industrial locations the protective value of either zinc or cadmium coatings is practically proportional to their thickness.

7. Neither the methods used for preparing the steel employed in this investigation nor the variations made in the composition of the zinc- or cadmium-plating solutions had any effect on the protective value of the coating that was comparable with the effect of thickness.

8. Plated zinc coatings furnish about the same protection as hot-dipped coatings *of the same thickness.*

9. In the salt-spray and intermittent-immersion tests, the time required for failure of zinc coatings is approximately proportional to the thickness.

10. Plated zinc coatings fail more rapidly in the intermittent immersion than in the salt spray test.

11. Neither the salt spray nor intermittent immersion furnishes a reliable criterion of thickness of cadmium coatings or of their protective value relative to that of zinc in an industrial atmosphere.

12. The average thickness of either zinc or cadmium coatings can be determined reliably from the loss in weight in the antimony chloride-hydrochloric acid stripping test; and of cadmium coatings by stripping in ammonium nitrate or ammonium persulfate.

13. The Preece test is a fairly reliable measure of the distribution (but not of the actual thickness) of plated zinc coatings over 0.0005 in. It is not satisfactory for thinner coatings.

14. From a consideration of the specific gravities and equivalent weights of zinc and cadmium, it is apparent that they corrode at about the same electrochemical rate in an industrial atmosphere.

REFERENCE

Research Paper No. 867, J. Research Nat. Bur. Standards, 16, 185 (1936).

OUTDOOR EXPOSURE TESTS OF ELECTROPLATED NICKEL AND CHROMIUM COATINGS ON STEEL AND NONFERROUS METALS

(Concluded 1940)

Associates—

WILLIAM BLUM and P. W. STRAUSSER

National Bureau of Standards

This PROJECT COVERED extensive atmospheric exposure tests conducted through the cooperation of the AES, ASTM and National Bureau of Standards. Exposure tests of coatings of copper, nickel or chromium or combinations of these metals, plated upon steel, copper, brass, zinc and zinc base die castings were made in six locations. The results led to the following conclusions:

1. The most important factor in the protective value of nickel-chromium coatings on steel, brass, or zinc is the thickness of the nickel coatings.

2. On steel or zinc, a layer of copper under the nickel adds little to the protective value of thin coatings. With thick deposits, the protective value of the composite coating approaches, but does not exceed, that of a nickel coating of the same total thickness.

3. Variations in the methods of preparation and of nickel plating, which included the use of four bright nickel solutions supplied in 1938, had no large effects upon the protective value of the coatings.

4. Variations in the thickness of the chromium coating from 0.00001 to 0.00003 in. applied over nickel have very little effect, but if it is 0.00005 in. or more, cracking is likely to occur, especially over nickel coatings on brass.

5. Variations between basis metals of a given group have no large effects. A greater thickness of nickel is required to furnish a given degree of protection on zinc than on brass, and greater on steel than on zinc.

REFERENCES

Research Paper No. 1293; J. Research Nat. Bur. Standards, **24**, 443 (1940).

Mon. Rev. **24**, 822 (1937).

METHODS OF POLISHING STEEL AND THEIR EFFECTS UPON THE PROTECTIVE VALUE OF ELECTROPLATED COATINGS

(Concluded 1944)

Associates—

GERALD A. LUX and WILLIAM BLUM

STRIPS OF SAE 1010 cold rolled No. 3 finish steel were polished with 90 to 320 grit wheels to produce roughness RMS values of 1 to 65 microinches. The specimens were plated with copper, nickel and chromium of controlled thicknesses and were exposed to the atmosphere at New York, N. Y.; Sandy Hook, N. J.; and Washington, D. C. Some of the more important conclusions are:

1. Wide differences in the surface finish of the steel had no significant effects on the protective value of the plated coatings. The steel used was of a special grade that normally contains less foreign inclusions than other grades of steel and it is possible that the use of hot-rolled steel would have yielded differences as a result of polishing.

2. The results of the salt spray test were not nearly as reproducible as the outdoor exposure tests and no correlation was found with the atmospheric test.

3. The hot water, ferroxyl and condensation accelerated tests were also not as consistent and reproducible as the atmospheric tests.

4. The amount of metal removed in a single pass is small, and usually corresponds to an average reduction in thickness of from 0.0001 to 0.0005 in., according to the grain size and the wheel pressure.

5. The amount of metal removed per pass increases with the pressure.

6. The polishing pressure has no significant effect on the scratch depth.

7. Continued use of a wheel head in preparation of specimens was marked by a greater rate of decrease in Profilometer values than in weight of metal removed. In general, the end of the effective life of a wheel head was marked by a sharp decrease in Profilometer values rather than by a decrease in metal removed.

8. The application of oil or grease to polishing wheel heads of a given grain size materially reduces both the amount of metal removed and the Profilometer readings. With oiled wheels, a higher polishing pressure is required to remove enough metal to eliminate scratches from preceding finishes.

REFERENCES

Research Paper No. 1645; J. Research Nat. Bur. Standards, **34**, 295 (1945).

AES Proc. 1941, 54; 1942, 19.

HAVE YOU OVERLOOKED USING RINS-AID?

RINS-AID provides a water-repellent surface on freshly plated parts that makes almost all of the water flow instantly from the surface before staining occurs. Among the applications reported by users (which may suggest valuable uses to you) are:

TO PREVENT STAINING, TARNISHING AND FACILITATE DRYING—

- Automobile Bumpers
- Micrometer Assemblies
- Silver Plated Electrical Contact Mechanisms
- Complicated Cadmium Plated Assemblies
- Copper Plated Hardware
- Steel Springs
- Tubing—outside and inside

FOR COMPLETE DRAINAGE AND FREEDOM FROM NICKEL OR CHROMIC ACID SALTS

FOR POSITIVE ELECTRICAL CONTACT—

- Telescoping Auto Antennae

FOR PREVENTING RUSTING OF UNPLATED AREAS—

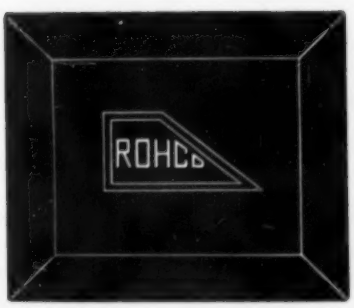
- Steel Parts

WHAT ARE THE AMAZING QUALITIES OF RINS-AID?

RINS-AID imparts a buffed appearance to chrome; gives a uniform, velvety appearance to cadmium; eliminates cut-through buffing of stained parts; in many cases eliminates special drying; removes water from the inside of tubes and other inaccessible areas, and makes active electropolished or bright dipped surfaces dry better without staining. It also provides an excellent way to prevent tarnish and add shelf-life to all plated articles. ONLY 2 TO 20 FLUID OUNCES OF RINS-AID ARE REQUIRED PER 100 GALLONS OF WATER.

FREE—ONE QUART TRIAL OFFER! Enough to demonstrate, under your own plating conditions, what RINS-AID does.

R. O. HULL & COMPANY, INC., 1302 Parsons Ct., Rocky River 16, Ohio

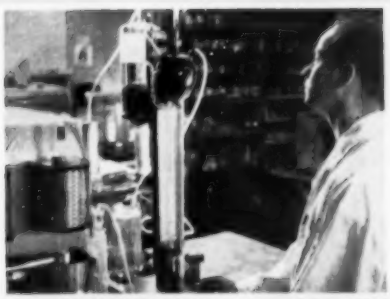


JUST PIN THIS COUPON TO YOUR LETTERHEAD

R. O. HULL & COMPANY, INC.
1302 Parsons Court
Rocky River 16, Ohio

Yes, send FREE, ONE QUART TRIAL OFFER of RINS-AID! No obligation, whatsoever.

Name..... Title.....
Company.....
Street Address.....
City..... Zone..... State.....



Illustrated are several views of our all new Wet and Spectrographic Laboratories, including some of the finest quality control equipment available.

"Al, you must be crazy . . ."

"A few years ago we decided to make our Quality Control Lab as good as could be found anywhere. We staffed it with first rate people and bought the latest in equipment including the finest Spectrographic Instrument available. At this point, our accountant — you know the type — a nice enough guy, but never happy unless he's shaking his head and wiggling his fingers at you . . . said to me, 'Al, you must be crazy, putting all this money into Quality Control.'

"Well, it took a lot of doing—and plenty of dollars, but it was worth it. We've grown steadily and it sure is a nice feeling to know that many of our regular customers include the finest platers in the country."

A. Kerzner

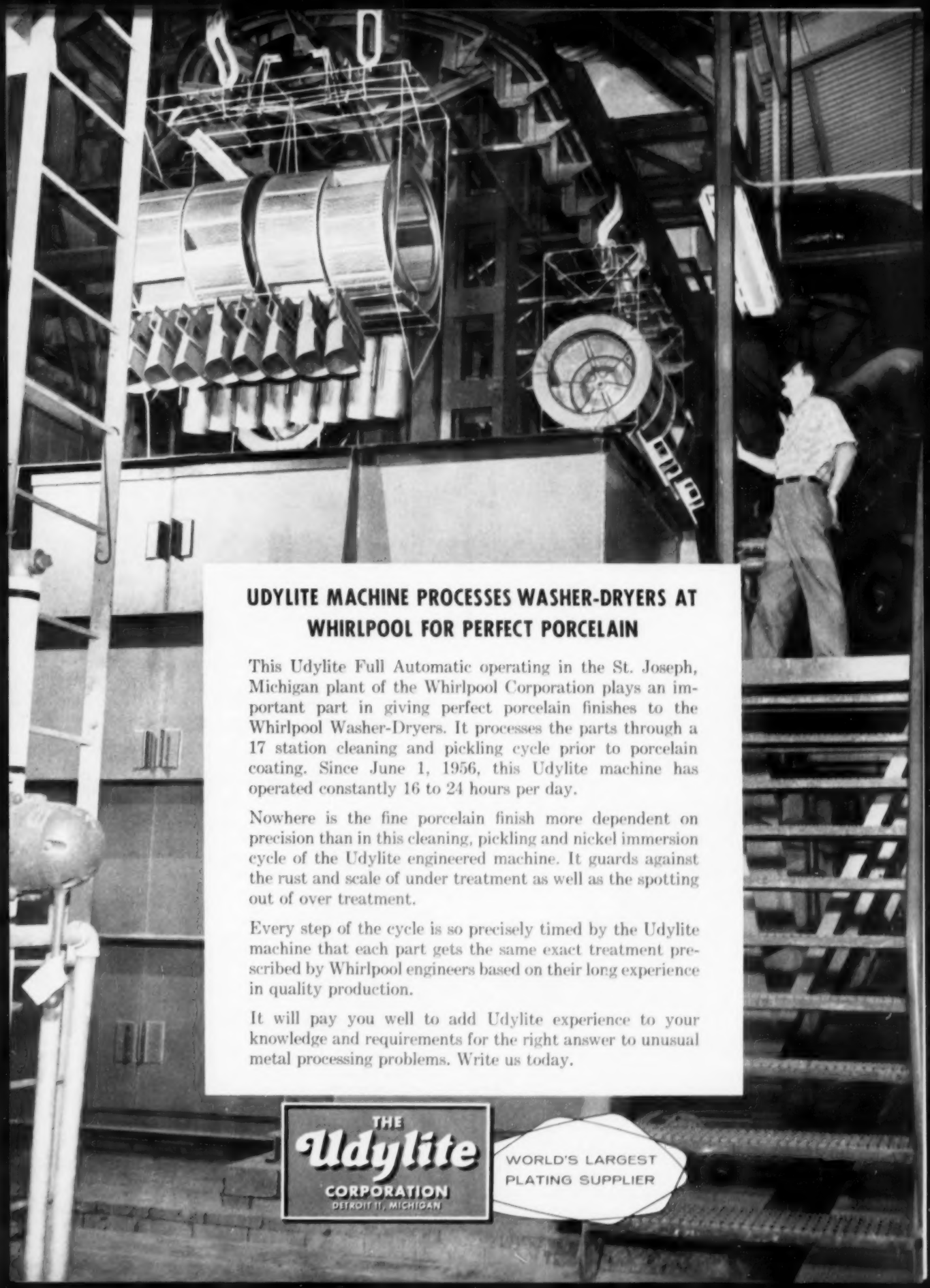
AL KERZNER, *President*

If you're a user of Copper, Nickel or Zinc Anodes, and if quality (at a competitive price) is an important factor to you, contact us! We manufacture them in a variety of sizes and shapes, and we can make them to your specifications.

NEW JERSEY METALS COMPANY 722 Rockefeller St., Elizabeth 2, N. J.

Serving Industry from Coast to Coast — since 1920

ELizabeth 4-6336



UDYLITE MACHINE PROCESSES WASHER-DRYERS AT WHIRLPOOL FOR PERFECT PORCELAIN

This Udylite Full Automatic operating in the St. Joseph, Michigan plant of the Whirlpool Corporation plays an important part in giving perfect porcelain finishes to the Whirlpool Washer-Dryers. It processes the parts through a 17 station cleaning and pickling cycle prior to porcelain coating. Since June 1, 1956, this Udylite machine has operated constantly 16 to 24 hours per day.

Nowhere is the fine porcelain finish more dependent on precision than in this cleaning, pickling and nickel immersion cycle of the Udylite engineered machine. It guards against the rust and scale of under treatment as well as the spotting out of over treatment.

Every step of the cycle is so precisely timed by the Udylite machine that each part gets the same exact treatment prescribed by Whirlpool engineers based on their long experience in quality production.

It will pay you well to add Udylite experience to your knowledge and requirements for the right answer to unusual metal processing problems. Write us today.

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

WORLD'S LARGEST PLATING SUPPLIER

Why Use A "Copy-cat" Finger-Buff*?

Insist on the Original Finger-Buff* . . .

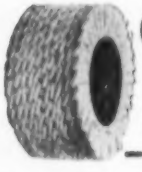
The CHURCHILL Finger-Buff*

• Let the Churchill Finger-Buff* . . . the original Finger-Buff* . . . prove its effectiveness to you . . . prove its greater flexibility and faster cutting action!

• Let Churchill experience work for you. Churchill originated the Finger-Buff* in 1937 and since then the designing of Churchill Finger-Buffs* has been Churchill's exclusive business.

• There is a Churchill Finger-Buff* available for every polishing, buffing and coloring operation. Simply write us your buffing problem and Churchill engineers will select the Churchill Finger-Buff* that meets your requirements . . . that will cut your operating expenses and give you superior results in every respect.

• Churchill Finger-Buffs* are made from sisal or cloth . . . always bias-cut . . . always top grade material . . . and in all sizes from 3" to 21" diameters.



Geo. R. Churchill Co., INC.

CHURCHILL FINGER BUFFS*

*Trade Mark Reg. U. S. Pat. Off.

REPRESENTATIVES IN PRINCIPAL CITIES

FREE Catalog

Geo. R. Churchill Co., Inc., Hingham, Mass., Dept. P
Please send me FREE catalog and complete information.

• My special buffing problem is .....

Name ..... Title .....

Firm .....

Street .....

City ..... Zone ..... State .....

USE READER SERVICE CARD; INDICATE A 724.

ZINC PLATERS:

FOR QUALITY PERFORMANCE AT LOWEST COST, purify cyanide zinc plating solutions with

McKeon's Zinc-Brite

TRADE MARK REG'D

Regular use keeps zinc solutions constantly clear. Eliminates need for ANY OTHER purifying treatment. Brightens work.

Write-Phone-Wire Collect

Sulphur Products Co. Inc.

621 West Pittsburgh St.
Greensburg, Pa.

USE READER SERVICE CARD; INDICATE A 725.

LEADING DESIGNERS & MANUFACTURERS OF SPECIAL AND STANDARD ABRASIVE BELT GRINDING & POLISHING MACHINES AUTOMATION EXPERTS

Model PG 300
Combination Wheel Platen & Free Belt Grinder
3" W. x 132" L. Belt

Bench & Wall Model Belt Grinders
Floor Model Belt Grinders
Adjustable Tongue Sanders
Swing Sanders
Horizontal Belt Grinders
Tube Belt Grinders—Internal Seam
Glass Seaming Belt Grinders
Abrasive Belt Grinders for Practically Every Application

Abrasive Belt Range

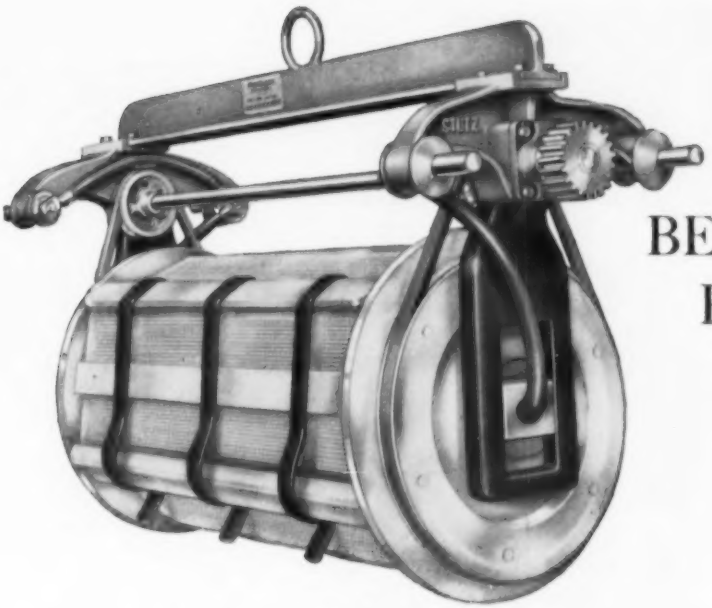
¼" to 10" Wide x 90" to 168" Long
Efficiently Operating in Plating, Die Cast, Polishing, Aircraft, Automotive, Tool Room, Plastic, Furniture, Pattern, Plumbing, Jet Blade, Appliance, Marine, Toy & Hardware Factories the World Over.

Literature On Request

BUSH MANUFACTURING CO.

900 ROCHESTER ROAD CLAWSON, MICHIGAN
Lincoln 5-3737

USE READER SERVICE CARD; INDICATE A 726.



unmistakably the finest

BELT DRIVEN PLATING BARREL

★ Lower Initial Cost

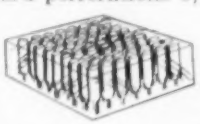
★ LOWEST Possible Maintenance

★ No Cylinder Gears

★ No Cylinder Bearings

Greater Current Carrying Capacity Which Lowers Plating Time and Cost . . .

Stutz Belt Drive complete cycle Plating Barrel. This unit incorporates a cylinder of one piece Plexiglas construction, suspended and rotated by two V belts and arranged between cast steel guide frames protected with 5/16″ thick special vulcanized hard rubber. For smooth barrel operation, saddle horns are located on 15″ centers, 4 provided for maximum current. Cylinder door is heavily reinforced and is locked with vinyl chloride covered spring steel bung clamps. Cathode contactors are dangler type. These units made to fit most makes of plating tanks and furnished also with motor drives mounted directly on cylinder superstructure. Standard sizes 14″x30″ and 14″x36″ (I.D.). 13 additional sizes from 12″x24″ to 18″x42″ (I.D.). Standard perforations 3/32″ round on 3/16″ centers. Dual hole for processing of extremely small parts available.



Specially designed counter pulleys of monel metal with deep dimples for positive grip against belt face.

This shows the belt expanding into the dimples of the driving pulleys. This action provides positive pull with no abrasion to the belt whatsoever.

Patent Pending

Write for Catalog & Prices

STUTZ PORTABLE PLATING BARRELS

- The Stutz Portable Barrel is made in 2 standard sizes with cylinders having inside dimensions of 6″ x 12″ and 8″ x 18″, I.D., and smaller upon application. Standard openings are 3/32″. Smaller or larger opening can be furnished as required.
- Baskets in perforated metals or wire mesh.
- Load–Unload Stand for convenient and fast handling of work load.

THE STUTZ COMPANY

4420 CARROLL AVENUE • CHICAGO 24, ILL.

"Complete Metal Finishing Equipment & Supplies"

Serving Industry 35 Years

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 727.

UNICHROME

News about

COATINGS for METALS

Metallic.....Organic.....Decorative.....Protective

New type chromium plate improves products

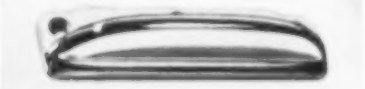
Why Crack-Free Chromium gives superior finish

Regular chromium plate develops a network of cracks as it is deposited. Through these defects, corrosives reach the underlying metal. Deposits from the Unichrome Crack-Free Chromium Plating Process remain structurally sound and continuous. This explains the wide difference in degree of corrosion protection obtained.

OTHER PROPERTIES

Crack-Free Chromium also provides:

1. Increased ductility, so that expansion and contraction cause no cracks.
2. Improved non-galling, non-seizing properties.
3. Low friction, resistance to wear.
4. Hardness (500 to 700 Knoop).
5. Excellent leveling action to help cover surface irregularities and reduce grinding needs.
6. Protection to the base metal without undercoats.
7. A satin matte *decorative* finish that can be applied directly to zinc die casting as well as steel. It buffs readily to high luster, can provide two-tone effects as shown below.

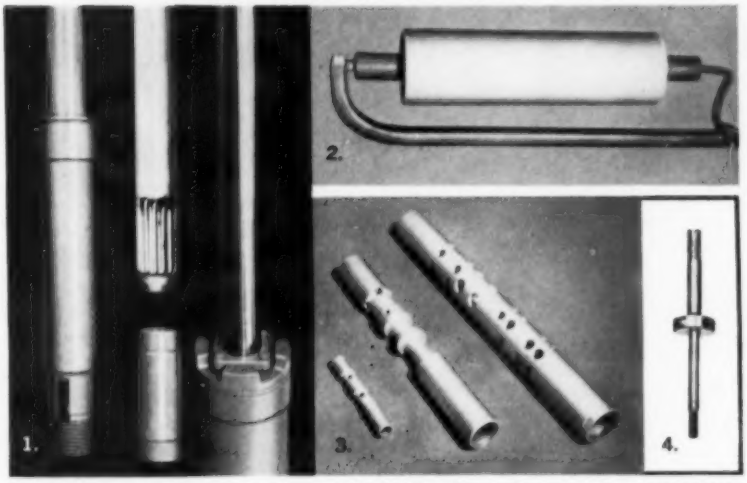


Bulletin CFC-2 gives more details on self-regulation and other features.

Unichrome is a trademark of Metal & Thermit Corp.

METAL & THERMIT
CORPORATION

General Offices: Rahway, New Jersey
Pittsburgh • Atlanta • Detroit
East Chicago • Los Angeles
In Canada: Metal & Thermit—United Chromium of Canada, Limited, Rexdale, Ont.



A few of the applications where Unichrome Crack-Free Chromium can be used to protect against corrosion, heat, wear. (1) Washer shafts and sleeve; hydraulic ram. (2) Roller. (3) Heater nozzles. (4) Component part of power producing mechanisms.

Difficult problems created by heat, wear, corrosion solved by Crack-Free Chromium

Field reports confirm that Unichrome Crack-Free Chromium is truly a new type of chromium plate with valuable characteristics. It is being used in applications once thought impractical for chromium or other deposits—thereby opening new opportunities for electroplating. Here are some suggestions:

IMPROVING HYDRAULIC SYSTEMS

On hydraulic rams, power steering shafts, hydraulic jacks being plated with Crack-Free Chromium, relatively thin deposits protect against corrosion, reduce friction and wear. Where aqueous hydraulic fluid penetrated the cracks in .003 to .005" of ordinary chromium, a .0009" Crack-Free deposit stopped it.

Washing machine and typewriter parts, spline shafts, piston rings, relay armatures are other applications where corrosion problems have been solved.

COMBATING THERMAL SHOCK

Spouts for pouring 2250°F. molten glass into molds last four times longer when plated with Crack-Free Chromium instead of ordinary chromium.

Increased ductility combines with resistance to thermal shock for other benefits. Crack-Free Chromium permits faster, deeper grinding cuts without fracture. On renewed transmission cams, this plate didn't fracture in service, whereas ordinary chromium did on 30% to 40% of the cams.

SLOWING DOWN WEAR

Crack-Free Chromium enables one user to increase life of textile machine rolls by 400% while cutting chromium deposit thickness 95%. It has also increased service life of drills, taps and reamers by 300%, compared with ordinary chromium.

Results such as these are being made possible through platers who have installed Unichrome Crack-Free Chromium and are able to offer this new type of chromium. Write Metal & Thermit for more application possibilities.

Herberth E. Head
First Vice President

Francis T. Eddy
President

Ralph D. Wysong
Second Vice President

1957 - 1958

NATIONAL OFFICERS

Elected at the Montreal Convention meeting of the Supreme Society, June 20, Francis T. Eddy, Technicraft Laboratories, Inc. of Thomaston, Connecticut, succeeded Dr. Samuel Heiman as national president of the American Electroplaters' Society.

The Supreme Society also elected Herberth E. Head, Chrysler Corporation, first vice president; Ralph D. Wysong, Studebaker-Packard Corp., second vice president and Dr. W. Andrew Wesley, International Nickel Company, third vice president.

Dr. Heiman will serve on the Executive Board as past president and John P. Nichols continues as executive secretary.

To these, PLATING extends its hearty best wishes for fruitful and effective tenure.

Dr. W. Andrew Wesley
Third Vice President

Dr. Samuel Heiman
Past President

John P. Nichols
Executive Secretary

FINANCIAL REPORT

FOR THE FISCAL YEAR ENDED MARCH 31, 1957

AMERICAN ELECTROPLATERS' SOCIETY
445 BROAD STREET
NEWARK 2, NEW JERSEY

We have examined the balance sheets of the General Fund and Research Fund of American Electroplaters' Society, Incorporated (New Jersey Corporation) as of March 31, 1957, and the related statements of income and funds for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

The accompanying balance sheets and statement of income are exclusive of certain accounts described in the notes appended thereto.

In our opinion, the accompanying balance sheets and statements of income, except as indicated above, present fairly the financial position of American Electroplaters' Society, Incorporated at March 31, 1957, and the results of its operations for the year then ended, in conformity with procedures generally followed by similar organizations, on a basis consistent with that of the preceding year.

CLYDE A. ZUKSWERT & CO.
Certified Public Accountants

Newark, New Jersey
May 10, 1957

FINANCIAL STATEMENT OF THE SUPREME SOCIETY OF THE AMERICAN ELECTROPLATERS' SOCIETY, INC.

General Fund—Comparative Balance Sheet—March 31, 1957 and 1956

	"Society"	"Plating"	Total 1957	Total 1956	Increase Decrease*
ASSETS					
CURRENT ASSETS:					
DEMAND DEPOSITS:					
Fidelity Union Trust Company (North Ward Branch), Newark, N. J.	$5,083.92		$5,083.92	$9,934.15	$4,850.23*
National Newark & Essex Banking Co. (Washington Branch), Newark, N. J.		$37,648.89	37,648.89	24,441.59	13,207.30
Total demand deposits	$5,083.92	$37,648.89	$42,732.81	$34,375.74	$8,357.07
Petty cash	50.00		50.00	50.00	
United States Treasury bonds:					
Series K	9,660.00		9,660.00	9,690.00	30.00*
3-¼%, 6/15/83-78 (at cost)	15,682.20		15,682.20	15,682.20	
Total bonds	$25,342.20		$25,342.20	$25,372.20	$30.00*
Time deposits	$110,000.00		$110,000.00	$120,000.00	$10,000.00*
ACCOUNTS RECEIVABLE:					
Advertising, books, reprints, supplies and miscellaneous	465.23	8,322.94	8,788.17	6,875.45	1,912.72
Advances, conventions	3,235.00		3,235.00	2,500.00	735.00
Total accounts receivable	$3,700.23	$8,322.94	$12,023.17	$9,375.45	$2,647.72
Total current assets	$144,176.35	$45,971.83	$190,148.18	$189,173.39	$974.79
CONTRA ACCOUNTS:					
"Society" control		$10,020.59	$10,020.59		$10,020.59
Research Fund		230.00	230.00		230.00
Total contra accounts		$10,250.59	$10,250.59		$10,250.59
DEPOSIT, AMERICAN AIRLINES	$425.00		$425.00	$425.00	
CARL E. HEUSSNER AWARD FUND:					
Fidelity Federal Savings and Loan Association, Glendale, California	$3,000.00		$3,000.00	$3,000.00	
DEFERRED CHARGES:					
Printing and engraving		$6,048.89	$6,048.89		$6,048.89
Postage	$460.14	20.88	481.02	$176.76	304.26
Medals and certificates	157.71		157.71	79.20	78.51
Total deferred charges	$617.85	$6,069.77	$6,687.62	$255.96	$6,431.66
Total assets	$148,219.20	$62,292.19	$210,511.39	$192,854.35	$17,657.04

ASSETS Continued

	"Society"	"Plating"	Total 1957	Total 1956	Increase Decrease*
LIABILITIES AND FUND					
CURRENT LIABILITIES:					
Payroll tax deductions		$929.43	$929.43	$1,044.76	$115.33*
Hospital plan				16.22	16.22*
Foreign advances	$23.57		23.57	23.57	
Excise tax	4.85		4.85	6.60	1.75*
Exchanges	72.20		72.20	13.99	58.21
Accounts payable (Note 2)	842.79	6,228.89	7,071.68		7,071.68
Accounts receivable, credit balances		45.16	45.16		45.16
Accrued expenses (Note 2)		888.12	888.12		888.12
Total current liabilities	$943.41	$8,091.60	$9,035.01	$1,105.14	$7,929.87
CONTRA ACCOUNTS:					
Plating control	$10,020.59		$10,020.59		$10,020.59
Research Fund	30.57		30.57		30.57
Total contra accounts	$10,051.16		$10,051.16		$10,051.16
CARL E. HEUSSNER AWARD FUND	$3,200.21		$3,200.21	$3,170.91	$29.30
GENERAL FUND	134,024.42	$54,200.59	188,225.01	188,578.30	353.29*
Total liabilities and fund	$148,219.20	$62,292.19	$210,511.39	$192,854.35	$17,657.04

Notes: 1. The above comparative balance sheet does not include inventories of publications, literature and supplies, office furniture, and equipment.
2. Accrual of accounts payable not made for fiscal year ended March 31, 1956, and prior periods.

EXHIBIT B

COMPARATIVE STATEMENT OF INCOME
GENERAL FUND—"SOCIETY" CONTROL
For the years ended March 31, 1957 and 1956

	Annual Budget 1956-1957	Year Ended March 31 1957	Year Ended March 31 1956	Increase Decrease*
INCOME:				
Per Capita Tax and Dues (Pro rata share):				
Members	$18,000.00	$17,763.33	$17,514.16	$249.17
Members-at-large	1,300.00	1,903.91	1,165.01	738.90
Sustaining members	1,015.00	920.70	943.65	22.95*
Publications, etc.:				
Technical "Proceedings"	1,800.00	3,610.35	1,696.06	1,914.29
Books, other Society publications	5,625.00	4,232.83	6,500.86	2,268.03*
Branches:				
Supplies	200.00	198.45	144.86	53.59
Other Income:				
Interest on investments	5,000.00	4,771.00	5,600.22	829.22*
Conventions		357.50		357.50
Mailing services	3,600.00	1,271.84		1,271.84
Miscellaneous income		7.50	1,211.54	1,204.04*
Total income	$36,540.00	$35,037.41	$34,776.36[1]	$261.05
EXPENSES:				
Publications, etc.:				
Technical "Proceedings"	$17,000.00	$18,665.32	$14,795.24	$3,870.08
Books, other Society publications	4,300.00	3,088.12	4,731.82	1,643.70*
Copyright expense		4.00	4.00	
Process Control Handbook	100.00		1,050.00	1,050.00*
Headquarters—Personnel (Pro rata share):				
Staff salaries	19,732.18	20,797.17	12,983.47	7,813.70
Social security and hospitalization	300.00	470.15	273.44	196.71
Travel	1,600.00	1,421.26	1,626.26	205.00*
Headquarters—Office (Pro rata share):				
Office expenses:				
Rent		1,150.00	1,140.00	10.00
Telephone and telegraph		782.20	411.79	370.41
Postage and express		807.89	884.83	76.94*
Office supplies	4,300.00	415.79	407.90	7.89
Printing and stationery		612.07	195.42	416.65
Insurance		58.12	162.44	104.32*
Legal and accounting		663.34	396.55	266.79
Miscellaneous general expense		407.07	243.93	163.14
Library and historical		16.25		16.25
Cost of index		357.25	175.00	182.25
Cost of mailing service	2,400.00	920.35		920.35
Furniture and equipment	700.00	233.09	854.60	621.51*
Furniture and fixtures repairs		112.59	200.75	88.16*
Office alterations and repairs	275.00	250.05		250.05

EXPENSES Continued

	Annual Budget 1956-1957	Year Ended March 31 1957	1956	Increase Decrease*
National Officers:				
Travel (pro rata share)	2,250.00	1,820.91	1,898.02	77.11*
Supplies	100.00	78.50	87.71	9.21*
Public Relations:				
Public relations	4,300.00	4,963.01	5,252.85	289.84*
Committee meeting expense	400.00	384.09		384.09
Branches:				
Supplies	900.00	71.40	132.04	60.64*
Miscellaneous branch expense		354.57	701.14	346.57*
Bad debts			3.95	3.95*
Total expenses	$58,657.18	$58,904.56	$48,613.15	$10,291.41
EXCESS OF EXPENSES OVER INCOME	$22,117.18	$23,867.15	$13,836.79[1]	$10,030.36*

Note[1] Income for year ended March 31, 1956 included $17,383.31 from Industrial Finishing Exposition additional.

EXHIBIT C

STATEMENT OF GENERAL FUND ACCOUNT

For the year ended March 31, 1957

	"Society"	"Plating"	Total
BALANCE, APRIL 1, 1956	$158,264.07	$30,314.23	$188,578.30
ADD:			
Excess of income over expenses for the year ended March 31, 1957, per Exhibit D		23,886.36	23,886.36
Sale of equipment	7.50		7.50
Total	$158,271.57	$54,200.59	$212,472.16
DEDUCT:			
Excess of expenses over income for the year ended March 31, 1957, per Exhibit B	$23,867.15		$23,867.15
Cost of books chargeable to prior years	380.00		380.00
Total	$24,247.15		$24,247.15
BALANCE, MARCH 31, 1957	$134,024.42	$54,200.59	$188,225.01

EXHIBIT D

COMPARATIVE STATEMENT OF INCOME
GENERAL FUND—"PLATING" CONTROL

For the years ended March 31, 1957 and 1956

	Annual Budget 1956-1957	Year Ended March 31 1957	1956	Increase Decrease*
INCOME:				
Advertising (except classified)		$175,927.78	$170,193.77	$5,734.01
Less:				
Discounts allowed		$2,742.44	$2,567.69	$174.75
Agency commissions		23,451.00	21,559.86	1,891.14
Total deductions		$26,193.44	$24,127.55	$2,065.89
Net	$160,000.00	$149,734.34	$146,066.22	$3,668.12
Subscriptions:				
Members (pro rata share of per capita tax)	$13,500.00	$13,151.95	$12,975.89	$176.06
Members-at-large (pro rata share of dues)	450.00	637.72	382.34	255.38
Sustaining members (pro rata share of dues)	800.00	682.00	699.00	17.00*
Non-members	6,000.00	6,819.76	6,013.79	805.97
Total subscriptions	$20,750.00	$21,291.43	$20,071.02	$1,220.41
Sales:				
Reprints	$5,000.00	$5,133.89	$1,946.23	$3,187.66
Classified advertising		356.00	299.00	57.00
Miscellaneous		82.90		82.90
Total sales	$5,000.00	$5,572.79	$2,245.23	$3,327.56
Total income	$185,750.00	$176,598.56	$168,382.47	$8,216.09

EXHIBIT D Continued

	Annual Budget 1956-1957	Year Ended March 31 1957	1956	Increase Decrease*
EXPENSES:				
Monthly publication expense:				
Printing costs		$73,122.85	$76,584.03	$3,461.18*
Other costs	$80,000.00	5,194.52	7,957.77	2,763.25*
Headquarters—Personnel:				
Salaries	51,569.64	47,794.00	48,863.67	1,069.67*
Social security and hospitalization (pro rata share)	1,025.00	946.68	912.41	34.27
Commissions:				
Advertising manager	2,700.00	1,690.38	1,106.18	584.20
Assistant advertising manager		502.13	574.31	72.18*
Travel	6,300.00	3,766.83	7,175.11	3,408.28*
Headquarters—Office (pro rata share):				
Office expenses:				
Rent		3,190.00	3,180.00	10.00
Telephone and telegraph		3,233.16	3,146.69	86.47
Postage and express		1,429.40	1,721.46	292.06*
Office supplies	9,775.00	951.80	797.80	154.00
Printing and stationery		1,245.92	1,704.15	458.23*
Insurance		83.15	270.71	187.56*
Legal and accounting		718.08	736.46	18.38*
Miscellaneous general expense		287.58	687.38	399.80*
Furniture and equipment	800.00	608.97	1,596.07	987.10*
Furniture and equipment repairs		236.49	159.59	76.90
Office alterations and repairs	575.00	499.95		499.95
National Officers:				
Travel (pro rata share)	2,250.00	1,725.27	1,672.34	52.93
Promotional advertising	2,500.00	1,408.35	2,366.37	958.02*
Reprints	3,500.00	3,724.29	1,500.80	2,223.49
Public relations	500.00	308.40		308.40
Bad debts			254.85	254.85*
Copyright expense		44.00	48.00	4.00*
Total expenses	$161,494.64	$152,712.20	$163,016.15	$10,303.95*
EXCESS OF INCOME OVER EXPENSES	$24,255.36	$23,886.36	$5,366.32	$18,520.04

EXHIBIT E **COMPARATIVE BALANCE SHEET—RESEARCH FUND**
March 31, 1957 and 1956

	March 31 1957	1956	Increase Decrease*
ASSETS			
CURRENT ASSETS:			
Demand deposit—National Newark & Essex Banking Co. (Washington Branch), Newark, N. J.	$29,080.39	$21,185.45	$7,894.94
Time deposits	84,000.00	84,000.00	
Accounts receivable	37.14	27.30	9.84
General Fund, "Society" Control (contra)	30.57		30.57
Total assets	$113,148.10	$105,212.75	$7,935.35
LIABILITIES AND FUND			
CURRENT LIABILITIES:			
Payroll deductions	$77.52		$77.52
General Fund, PLATING Control (contra)	230.00		230.00
Accrued expenses	35.46		35.46
Total current liabilities	$342.98		$342.98
RESEARCH FUND	112,805.12	$105,212.75	7,592.37
Total liabilities and fund	$113,148.10	$105,212.75	$7,935.35

EXHIBIT F

AMERICAN ELECTROPLATERS' SOCIETY, INCORPORATED
(New Jersey Corporation)
COMPARATIVE STATEMENT OF INCOME, RESEARCH FUND
For the years ended March 31, 1957 and 1956

	Annual Budget 1956-1957	Actual Year Ended March 31 1957	1956	Increase Decrease*
INCOME:				
Sustaining membership dues and subscriptions (pro rata share)	$40,000.00	$31,897.30	$33,308.10	$1,410.80*
Per capita tax (pro rata share)	6,700.00	6,575.95	6,487.95	88.00
Member-at-large dues (pro rata share)	200.00	319.05	191.23	127.82
Sale of reprints	700.00	223.14	717.91	494.77*
Interest on investments	2,950.00	2,886.67	2,467.50	419.17
Miscellaneous income	330.00	—	—	—
Branch contributions		200.00		200.00
Contribution by other society		500.00		500.00
Total income	$50,880.00	$42,602.11	$43,172.69	$570.58*

EXHIBIT F Continued

	Annual Budget 1956-1957	Actual Year Ended March 31 1957	1956	Increase Decrease*
EXPENSES:				
Transfer to Canadian Research Fund	$6,000.00	$3,999.13	$3,864.09	$135.04
Project payments to institutions		20,150.00	11,100.00	9,050.00
Project payments to directors and associates (Note)	39,515.00	7,934.52	9,531.93	1,597.41*
Reprint purchases	1,550.00	204.33	1,030.73	826.40*
Social security tax	125.00	66.21	66.06	.15
Traveling expenses	125.00		107.72	107.72*
Sustaining membership promotion and certificates	450.00	385.45	351.95	33.50
Bad debts			9.85	9.85*
Miscellaneous expenses, including postage	700.00	730.90	604.17	126.73
Office expense	1,500.00	1,234.30	831.66	402.64
Contingent	915.00	218.08		218.08
Exchange fees		86.82		86.82
Total expenses	$50,880.00	$35,009.74	$27,498.16	$7,511.58
EXCESS OF INCOME OVER EXPENSES	—	$7,592.37	$15,674.53	$8,082.16*

NOTE:
Additional payments authorized by Research Committee were made during year ended March 31, 1957:

Virginia Institute of Research	$1,000.00
Yale University	756.00
Total	$1,756.00

STATEMENT OF RESEARCH FUND ACCOUNT

For the year ended March 31, 1957

BALANCE, APRIL 1, 1956	$105,212.75
ADD:	
Excess of income over expenses for the year ended March 31, 1957, per Exhibit F	7,592.37
BALANCE, MARCH 31, 1957	$112,805.12

EXHIBIT G

COMPARATIVE STATEMENT OF RECEIPTS AND DISBURSEMENTS CANADIAN RESEARCH FUND

For the years ended March 31, 1957 and 1956

	Year Ended March 31 1957	1956	Increase Decrease*
BALANCE, APRIL 1 (THE TORONTO-DOMINION BANK, TORONTO, CANADA)	$1,988.55	$2,120.58	$132.03*
RECEIPTS:			
American Electroplaters' Society, Research Fund	$3,999.13	$3,864.09	$135.04
Branch contribution	100.00		100.00
Sustaining membership dues	1,900.00	2,000.00	100.00*
Interest	17.14	12.19	4.95
Total receipts	$6,016.27	$5,876.28	$139.99
Total	$8,004.82	$7,996.86	$7.96
DISBURSEMENTS:			
Ontario Research Foundation	$6,000.00	$6,000.00	
Discount and exchange	28.99	8.31	$20.68
Total disbursements	$6,028.99	$6,008.31	$20.68
BALANCE, MARCH 31 (THE TORONTO-DOMINION BANK, TORONTO, CANADA)	$1,975.83	$1,988.55	$12.72*

O. Kardos

D. G. Foulke

W. M. Tucker

F. O. Beuckman

W. H. Safranek

G. R. Schaer

HONORED AT THE SOCIETY'S 44TH ANNUAL CONVENTION

The Society bestows six awards at its Annual Convention for original contributions which have appeared in PLATING and "Technical Proceedings" during the preceding fiscal year. The Paper Awards Committee, appointed by the AES President, selects these papers on the basis not only of their immediate value to the plating and metal finishing industries but also of their scientific value, originality of subject matter and clarity of presentation. These awards and their 1957 winners:

THE CARL HEUSSNER AWARD consisting of the AES gold medal, an award of $50, and a certificate for the best paper is co-sponsored by the AES and the United Platers' Foundation, Detroit, Michigan.

Awarded to "*Current Distribution on Microprofiles*" by Dr. D. G. Foulke and Dr. O. Kardos, Hanson-Van Winkle-Munning Co. (43rd Annual Convention—Pages 172 & 182, 1956 "Technical Proceedings")

THE GEORGE B. HOGABOOM MEMORIAL AWARD consisting of a silver medal, a certificate and an award of $50 for the second best paper. Co-sponsored by the AES and the Hartford (Conn.) Branch.

Awarded to "*Dissolved Gases in Plating Baths*" by W. M. Tucker and F. O. Beuckman, Eastman Kodak Co. (43rd Annual Convention—Page 118, 1956 "Technical Proceedings")

THE AES BRONZE MEDAL AWARD consisting of a bronze medal and a $15 award for the third best paper is co-sponsored by the AES and the Grand Rapids Branch.

Awarded to "*Properties of Electrodeposits at Elevated Temperatures*" by W. H. Safranek and G. R. Schaer, Battelle Memorial Institute. (43rd Annual Convention—Page 105, 1956 "Technical Proceedings")

THE ROBERT S. LEATHER AWARD co-sponsored by the AES and the Lea Manufacturing Company, consisting of $50 and a certificate for the best contribution to the knowledge and art of mechanical finishing.

Awarded to "*Mechanical Finishing of Precision Parts*" by L. H. Hopewell, Fairchild Camera & Instrument Corp. (January 1956 "Plating")

THE CHROMIUM PLATING AWARD co-sponsored by the AES and the Nutmeg Chrome Corporation, consists of a $50 award and a certificate for the best paper on the subject of chrome plating.

Awarded to "*Chromium Plating of Gun Bores*" by Dr. V. A. Lamb and J. P. Young of the National Bureau of Standards. (43rd Annual Convention—Page 260, 1956 "Technical Proceedings")

THE PRECIOUS METAL PLATING AWARD co-sponsored by the AES and Technic, Inc., consisting of $50 and a certificate for the best paper on the plating of gold, rhodium, platinum, palladium and silver.

Awarded to "*Gold-Silver Alloy Plating*" by Dr. R. E. Harr and A. G. Cafferty, Western Electric Co. (43rd Annual Convention—Page 62, 1956 "Technical Proceedings")

This year's Paper Awards Committee was headed by Dr. Abner Brenner of the National Bureau of Standards and was composed of Leslie Diveley, Cutler-Hammer Co., and Lloyd O. Gilbert, Rock Island Arsenal. This able Committee selected all the foregoing except the winner of the Chromium Plating Award.

Because one of the papers competing for this Award was prepared by members of his department, Dr. Brenner disqualified himself and appointed Past President Arthur W. Logozzo of the Nutmeg Chrome Corporation to serve in his place with the leadership of this subcommittee vested in Leslie Diveley. The subcommittee unanimously chose the above winner.

L. H. Hopewell

V. A. Lamb

J. P. Young

R. E. Harr

A. G. Cafferty

PLATERS IN MONTREAL AT CONVENTION TIME

(1) Conventioneers registering in the ballroom of the Sheraton-Mt. Royal Hotel for the 44th AES Annual Convention. (2) Superintendent of the Royal Canadian Mounted Police, E. Brakefield-Moore, sounding the Convention Keynote. Seated, Philip M. Coady and Mrs. G. Ross Davidson. (3) Dais at the opening session. Left to right, Ralph D. Wysong, 3rd vice president; Herberth E. Head, 2nd vice president; Clyde Kelly, past president; Rev. Frank C. Mesle; C. M. Douglas, convention co-chairman; Supt. E. Brakefield-Moore; T. Ross Davidson, convention general chairman; Philip M. Coady, educational chairman; Mrs. G. Ross Davidson, ladies chairman; Dr. Samuel Heiman, president; Francis T. Eddy, 1st vice president; John P. Nichols, executive secretary; John Palik Jr., president, National Association of Metal Finishers. (4) Dr. Heiman addresses the convention at the opening session. (5) Dr. D. Gardner Foulke, secretary of Newark Branch, at the registration table. At right, Mendel Cohen, plant visitation chairman. (6) Crowd at the Get-Together Party on Sunday night. (7) Attentive audience at opening session. (8) Meeting of the Credentials Committee. Clockwise from left, Dr. Samuel Heiman, Fred Fulforth, John P. Nichols, George Schore, Cleveland Nixon. (9) Mrs. and Past President Franklin J. MacStocker. (10) Mrs. Francis T. Eddy, Mrs. Joan Wierda, Walter L. Pinner, Mrs. Pinner, Robert A. Ehrhardt. (11) Mrs. Davidson and General Chairman G. Ross Davidson. (12) Philip M. Coady, Dr. John Kane, Mrs. Coady. (13) Past President and Mrs. George Wagner. (14) Mrs. and Mr. Francis T. Eddy. (15) Mr. and Mrs. John P. Nichols and son, John Jr. (16) Dr. William Blum registers for the convention. (17) The Misses Mary I. Bowman and Margaret Pierdon, Mrs. and Mr. Arthur G. Pierdon.

AES NEWS

D. C. Austin
Editorial

J. D. Thomas
Research

G. R. Davidson
Editorial

K. Wells
Research

A. M. Max
Editorial

G. B. Bowman
Research

SEVEN STALWARTS NAMED TO KEY COMMITTEES

Six highly qualified AES members were honored at the recent 44th Annual Convention of the Society held in Montreal by Executive Board appointment to the Editorial Board and to the Research Committee respectively for three-year terms each.

To the Editorial Board, the Executive Board named Donald C. Austin, Chrysler Corporation; G. Ross Davidson, Canadian Hanson & Van Winkle, Ltd. and Dr. Abraham M. Max of the Radio Corporation of America. Robert D. Miller, Electric Auto-Lite Company, continues on the Board for this fiscal year as Host Educational Chairman of the 1958 Cincinnati Convention.

These succeed Howard J. McAleer, Formax Manufacturing Co.; Dr. Harold J. Wiesner, Bendix Aircraft and Philip M. Coudy, Rediweld (Canada) Ltd., Host Educational Chairman of the 1957 Montreal Convention, whose terms expired.

Glade B. Bowman, Rockwell Spring and Axle Company; James D. Thomas, General Motors; and Kergan Wells of W. W. Wells, Limited compose the newly appointed members of the Research Committee.

They succeed Arthur H. Du Rose, Harshaw Chemical Co.; Arthur P. Wrisberg, Davies Supply & Manufacturing Co. and Lloyd O. Gilbert, Rock Island Arsenal, whose three-year terms expired.

To their retiring members, both the Editorial Board and the Research Committee expressed hearty thanks and congratulations for significant performance during their tenures. They welcomed their new members with confident anticipation of sound three-year service.

Mohawk Valley Branch Granted Temporary Charter

An AES Branch has been formed in the historic Mohawk Valley area in upstate New York and that body, with an impressive nucleus of members, was voted a Temporary Charter at the recent Montreal meeting of the Executive Board.

Over 70 enthused men attended the infant Branch's recent organizational meeting, including visiting members from Syracuse, Rochester, Buffalo, Capitol District and elsewhere in that area.

Francis Czech, General Electric Company, was elected Branch president and Charles P. Raehm Jr., of the same company, was voted secretary-treasurer.

Other officers include Charles Bridgett, Hanson-Van Winkle-Munning Co., as first vice president; Jack Benson, General Electric Co., second vice president and George Simmons, H. M. Quackenbush Co., librarian.

Under the AES Constitution, this new Branch must operate a minimum of three months under Temporary Charter. Thereafter, it may be voted a Permanent Charter by the Executive Board, thus making it the Society's 57th Branch. The Society heartily welcomes it.

MIAMI BRANCH RECEIVES PERMANENT CHARTER

At an impressive installation ceremony held in Miami Friday, May 24, Dr. Heiman, right, AES president, installed the Miami Branch as the Society's 56th permanently chartered affiliate. The handsome framed Permanent Charter was accepted in behalf of the Branch by M. H. Dent, left, new Branch president. In the center, Thomas M. Rodgers, guest, member of Baltimore-Washington Branch, one of the principal organizers of Miami Branch. Beside Mr. Dent, the elected officers of the Miami Branch include Ernest Owens, vice president; James Gibbs, second vice president; Arthur F. Newlander, secretary-treasurer and Robert F. Wharton, librarian.

Branch Membership Campaign Winners

Newark, St. Joseph Valley and Mississippi Valley Branches each received an award of $50 at the AES Montreal Convention for capturing first place in their divisions in the Annual Branch Membership Expansion Competition.

Newark, top Branch in the First Division (126 and more members) added 62 new members and showed a membership increase of 20.8 per cent.

St. Joseph Valley carried off Second Division (70 to 125 members) honors by adding 31 new members and increasing its membership 31.5 per cent.

Percentagewise, Mississippi Valley, in the Third Division (10-69 members) topped all other Branches with an increase of 37.2 per cent. Seventeen new members were added.

The competition covered the fiscal-year period from April 1, 1956 through March 31, 1957.

In the following order, the runners-up in each Division were: First Division—Milwaukee, Toronto, Boston, Philadelphia; Second Division—Dayton, New Haven, Montreal, Southeastern; Third Division—Hamilton, Houston, Western Ontario, Southern Tier.

Empire State Regional Board Formed

A Regional Board composed of representatives of AES Branches in Northern New York State was formed at an organizational meeting held in Syracuse on Saturday, April 27. Branches represented at the meeting included Syracuse, Buffalo, Albany, Southern Tier and Rochester. George W. Cavanaugh of Syracuse served as chairman and was later elected president of the Board with Fred Thiem named secretary.

Expectedly, every Branch in that area will elect two members to serve on this new Empire State Regional Board for the term of one year. Purpose of the Board will be to arrange and conduct Regional Meetings in the Empire State area for the exchange of ideas and for the general improvement of Branch activity in that area. A set of bylaws will reportedly soon be prepared.

NATIONAL HEADQUARTERS PERSONNEL

Miss Linda Markowitz

Custodian of Sustaining Member records, billings et al, Miss Markowitz's work not only includes full service to such members but general utility as assistant to Mrs. Marsh, Office Manager.

ROYAL F. CLARK

An electroplater for 50 years, Royal F. Clark, 75, died on May 10 after suffering a heart attack earlier in the day.

Mr. Clark had resided at 368 Dayton St., Newark, N. J. and was a Founder Member of the AES and an Honorary Member and past president of the Newark Branch.

He was born in Trenton, N. J. where, upon completion of his schooling, he joined his father's business, Clark Bros. Lamp and Brass Co.

Mr. Clark moved to Newark in 1920 and for the next 30 years was an electroplater and foreman for electroplating firms in and around Newark until his retirement in 1950.

He is survived by his wife, son, a daughter, three grandchildren and two great grandchildren.

BOOKS

Remittance must accompany all book orders placed with AES Headquarters.

Chemical Surface Treatment of Titanium by H. A. Pray, P. D. Miller and R. A. Jefferys, Battelle Memorial Institute for U. S. Army Ordnance Corps. May 1953. 43 pages. $1.25. Order PB 111805 direct from Office of Technical Services, U. S. Department of Commerce, Washington 25.

Development of two chemical baths for coating the surfaces of titanium and its alloys for remarkable wear resistance is described. In the first, either heat-treated trisodium phosphate-fluoride or sodium-tetraborate-fluoride is used as a surface coating to provide continuous resistance for long periods of time. In the second, MoS_2-Epon-resin is added to the heat-treated phosphate-fluoride or borate-fluoride to coat the surface and provide resistance against high-speed rotary wear under relatively high loads. Sodium tetraborate fluoride bath 242D gave the most versatile coating to all alloys tested and caused only slight *p*H changes. Another advantage was control and reproducibility of the bath. Both treatments proved valuable because they produced wear resistance at a temperature below that of any phase transformation of titanium alloys. Phosphate-fluoride coatings showed promise in wire and tube-drawing evaluations, and similar promise was expected of borate-fluoride coatings.

Every batch checked. Every can filled with a full weight of extra high quality 99.75+% Chromic Acid. Prompt delivery from ample factory and nearby distributor stocks. Why not order BFC Chromic Acid next time?

BETTER FINISHES & COATINGS, INC.

268 Doremus Avenue, Newark 5, New Jersey

2014 East 15th Street, Los Angeles 21, California

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 729.

there's no end to the measure of quality, service and dependability you get with

SOLVAY HYDROGEN PEROXIDE

Write for SOLVAY Hydrogen Peroxide 24-page fact book and chart of handling precautions. No cost!

SOLVAY PROCESS DIVISION

ALLIED CHEMICAL & DYE CORPORATION
61 Broadway, New York 6, N. Y.

—BRANCH SALES OFFICES—

Boston • Charlotte • Chicago • Cincinnati • Cleveland
Detroit • Houston • New Orleans • New York
Philadelphia • Pittsburgh • St. Louis • Syracuse

INTERSOCIETY NEWS

American Society for Testing Materials Holds Annual Meeting

The 60th Annual Meeting of the American Society for Testing Materials was held at the Chalfonte-Haddon Hall in Atlantic City, N. J., June 16 to 21 inclusive.

Thirty-two technical sessions were held between Monday morning and Friday afternoon. At the Tuesday, June 18, luncheon, the retiring president, R. A. Schatzel, delivered his annual address. Awards and medals were presented at the Wednesday luncheon.

A highlight of the Tuesday luncheon was the introduction of the officers for 1957-1958. The new president is Richard T. Kropf, F. L. LaQue was elected vice president. Five new directors are C. L. Clark, A. E. Juve, J. H. Koenig, R. E. Peterson, R. W. Seniff.

Richard T. Kropf, vice president and director of research for Belding Heminway Company, Inc., since 1949, also directs the activities of the Industrial Thread Division, and serves as vice president and general manager of Belding Corticelli Industries, Inc.

F. L. LaQue has been a vice president of International Nickel Co. and manager of its Development and Research Division since June 1954.

He joined the International Nickel Co.'s Development and Research Division in 1927 and since has devoted his activities to the field of corrosion and corrosion-resisting materials. He was assistant director of technical service on mill products from 1937 until April 1940, when he became engaged in development of both ferrous and non-ferrous nickel-containing alloys. Under his leadership, the well-known corrosion testing stations of the company at Kure Beach and Harbor Island, N. C., were established.

Claude L. Clark has been associated with the Timken Roller Bearing Co. since 1940, first as research metallurgical engineer and later as metallurgical engineer.

Dr. Clark has been a member of ASTM since 1929 and has been active for many years on ASTM Committees A-1 on Steel; A-10 on Iron-Chromium, Iron-Chromium-Nickel and Related Alloys; and the Joint Committee on the Effect of Temperature on the Properties of Metals.

Arthur E. Juve has been employed by the B. F. Goodrich Co. since receiving his Bachelor of Chemical Engineering from the Ohio State University in 1925. Until 1942 he was engaged in compounding and development work on industrial products, and since 1942 has been in the Goodrich Research Division.

John H. Koenig has been director of the School of Ceramics and the New Jersey Ceramic Research Station at Rutgers University since 1945.

Rudolph Earl Peterson has spent most of his professional career with Westinghouse Electric Corp. and is presently manager, mechanics department of the Research Laboratories in Pittsburgh.

Mr. Peterson has been a member of ASTM since 1929 and has been chairman of ASTM Committee E-9 on Fatigue since it was organized in 1946. He is also vice-chairman of the ASTM Administrative Committee on Simulated Service Testing. He was given the ASTM Award of Merit in 1954.

Russell Wade Seniff has been manager of research for the Baltimore & Ohio Railroad since 1953.

Chairman Ranno Reports for NAMF Nickel Committee

In his report to members of the National Association of Metal Finishers, Mariano Ranno, chairman of the Nickel Committee stated in part:

"The first meeting of the Electroplating Industry Advisory Committee was held May 1, in Washington, D. C., under the auspices of the Business and Defense Services Administration, U. S. Department of Commerce.

"We were told that the distribution of nickel to platers by supply houses is now being carried out in general agreement with the principles as outlined in the Dept. of Commerce reports to Congress, Dec. 31, 1956 and Feb. 1957. Adherence to the principles of fair and equitable distribution of available nickel, therefore, will be followed, it was reported. It was emphasized that *users of small quantities of nickel* will receive their full share of that metal in the future.

"It was also reported that it probably will not be until 1959 or 1960 before the supply of nickel will meet the demand. However, we were told, also, that about 20 million pounds of the metal should be forthcoming from the Government-owned Nicaro project in Cuba before the end of the year, some of which will be distributed to our industry."

The meeting was attended by John Palik Jr., National Plating Corp., Cleveland, O.; Mariano Ranno, Imperial Plating Co., Brooklyn, N. Y.; David J. Griffin, Birmingham Plating Wks., Birmingham, Ala.; Edward J. Driscoll, Driscoll & Co., Chicago, Ill.; A. T. Leonard, Superior Plating, Inc., Minneapolis, Minn.; Cleveland F. Nixon, General Motors Corp., Detroit, Mich.; Joseph Gurski, Ford Motor Co., Detroit, Mich.; A. E. Howe, General Electric Co., Schenectady, N. Y.; Thomas Stoddard, Speakman Co., Wilmington, Del.; M. B. Hammond, Rockwell Spring & Axle Co., Coraopolis, Pa.; Harry B. Sharpe, Deputy Director, BDSA, Misc. Metals and Minerals Division, Chairman.

PATENT ABSTRACTS

DR. D. GARDNER FOULKE
Manager, Electrochemical Development
Hanson-Van Winkle-Munning Co
Matawan, New Jersey

Copies of patents may be obtained by writing to Commissioner of Patents, Washington, D. C. Price 25 cents each.

No. 2,775,809, January 1, 1957—Brazing of Molybdenum and Tungsten—R. S. Steinitz, assignor to Borolite Corp., Pittsburgh, Pa.

To braze molybdenum or tungsten parts to molybdenum, tungsten or tantalum parts use molybdenum boride (MO_2B) powder and heat to 1900 to 2100 C.

5 claims, figure.

No. 2,776,225, January 1, 1957—Process for the Production of a Wrinkle Finish—J. Fletcher, assignor to National Research Corp., Cambridge, Mass.

A highly reflectant, heat-resistant wrinkle finish can be obtained by coating with a solution of phenyl methyl siloxane resin, baking to partially cure, coat with aluminum by vacuum evaporation, then coating with more resin and baking to effect a complete cure.

4 claims.

No. 2,776,254, January 1, 1957—Rubber Bonding Process—S. Bart, Essex Falls, N. J.

The rubber bonding process as applied to propeller blades consists of spraying onto the core a plastic bonding material, baking at a temperature below 150 F, applying a thin coat of chlorinated bonding rubber cement free of sulfur, followed by a relatively thick coat of sulfur-free neoprene rubber after air drying the first layer, applying graphite and plating at 125 F to 150 F to complete the cure of the cements and deposit a layer of nickel on the rubber.

4 claims, 3 figures.

No. 2,776,255, January 1, 1957—Method of Making Formed Plated Articles—M. Hammond and G. Bowman, assignors to Rockwell Spring and Axel Co., Coraopolis, Pa.

The method consists of plating a coating of nickel on a polished flat steel strip, plating a coating of zinc thereon, then forming the article after which the zinc is stripped off by acid and the nickel activated by subjecting to an alkaline cathodic cleaning operation. Finally the article is acid dipped and additional nickel plated thereon.

4 claims.

No. 2,776,256, January 1, 1957—Making Intaglio Printing Cylinders—K. Eulner and J. Mueller, Louisville, Ky.

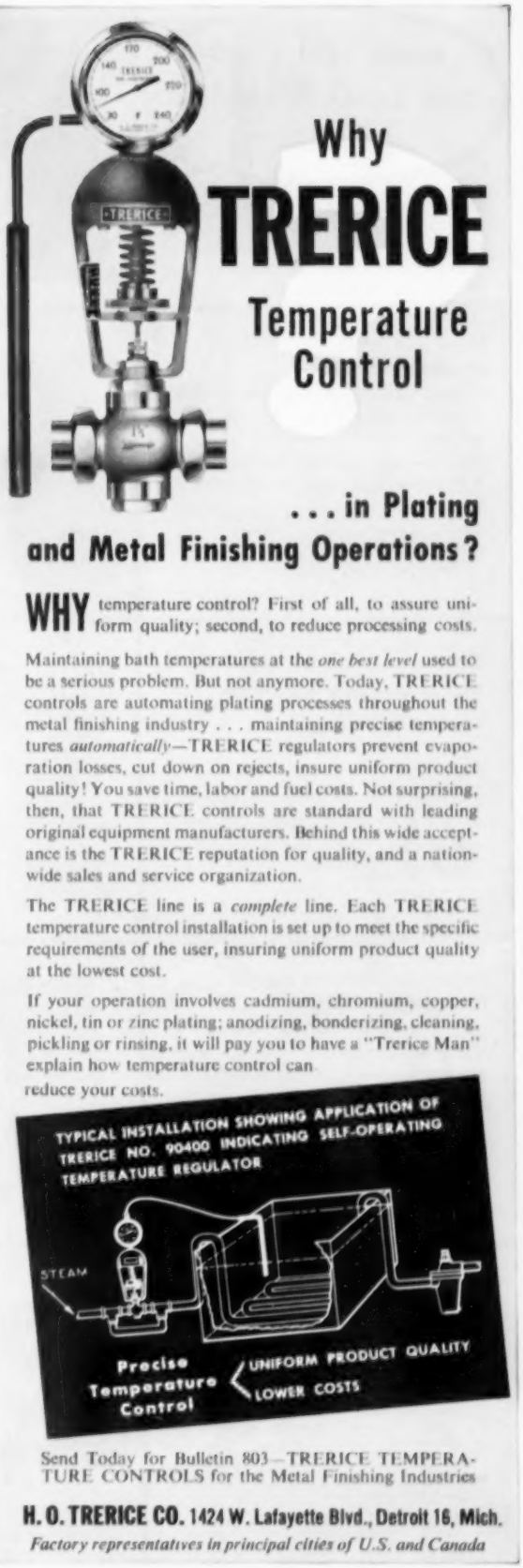
Copper is plated on cylinders which are rotated in a copper bath. While plating, the cylinders are brushed with a flexible brass bristle brush to produce a smooth polished cylinder.

10 claims, 3 figures.

No. 2,776,915, January 8, 1957—Method of Providing Silver Layers—G. van Oosterhaut and A. Bol, assignors to Hartford National Bank and Trust Co., Hartford, Conn.

To apply a silver layer, heat the object to 150 to 300 C, apply a silver salt of lactic or butyric acid to selected areas while the object is maintained at said temperature.

3 claims.


Why
TRERICE
Temperature Control
. . . in Plating and Metal Finishing Operations?
WHY temperature control? First of all, to assure uniform quality; second, to reduce processing costs.
Maintaining bath temperatures at the one best level used to be a serious problem. But not anymore. Today, TRERICE controls are automating plating processes throughout the metal finishing industry . . . maintaining precise temperatures automatically—TRERICE regulators prevent evaporation losses, cut down on rejects, insure uniform product quality! You save time, labor and fuel costs. Not surprising, then, that TRERICE controls are standard with leading original equipment manufacturers. Behind this wide acceptance is the TRERICE reputation for quality, and a nation-wide sales and service organization.
The TRERICE line is a complete line. Each TRERICE temperature control installation is set up to meet the specific requirements of the user, insuring uniform product quality at the lowest cost.
If your operation involves cadmium, chromium, copper, nickel, tin or zinc plating; anodizing, bonderizing, cleaning, pickling or rinsing, it will pay you to have a "Trerice Man" explain how temperature control can reduce your costs.
TYPICAL INSTALLATION SHOWING APPLICATION OF TRERICE NO. 90400 INDICATING SELF-OPERATING TEMPERATURE REGULATOR
STEAM
Precise Temperature Control
UNIFORM PRODUCT QUALITY
LOWER COSTS
Send Today for Bulletin 803—TRERICE TEMPERATURE CONTROLS for the Metal Finishing Industries
H. O. TRERICE CO. 1424 W. Lafayette Blvd., Detroit 16, Mich.
Factory representatives in principal cities of U.S. and Canada

HAVE YOU TRIED THIS EXTRAORDINARY CLEANER?

Oakite Rustripper removes rust and heat scale in the same operation that removes oil. Avoids hydrogen embrittlement, damage to machined surfaces, other disadvantages of acid pickling.

Have you taken the four good steps?

How can cleaning costs be reduced 33% while cleaning quality is being improved? *See pages 7 and 8 in the booklet.*

What are four easy ways to improve the average rinse tank? *See page 10.*

What causes hydrogen embrittlement during electrocleaning? What is the remedy? *See pages 15 and 16.*

Do you need a brass cleaner that gives better protection against tarnishing?

Oakite has a new brass cleaner that provides scientific protection against the oxygen that tarnishes brass and other copper alloys during the application of reverse current.

"It cut our cleaning rejects by more than 90%"

says a manufacturer who found that Oakite Composition No. 95 gave him:

BRIGHTER PLATING—All films removed . . . no residues, no undersurface shadows, no anodic blackening, nothing to impair the brightness of the electroplate.

FEWER REJECTS—Major causes of blistering and peeling eliminated . . . Consistent success in baking for 60 minutes at 300°F.

OAKITE PRODUCTS, INC.
26H Rector Street, New York 6, N. Y.

Send me the FREE booklets indicated below:

- ☐ Here's the best shortcut in the field of electroplating
- ☐ Four good steps toward better electroplating on steel
- ☐ What's NEW for electrocleaning brass and other copper alloys
- ☐ Good news about electrocleaning zinc-base die castings

NAME_____

COMPANY_____

ADDRESS_____

FREE
For further information, ask for booklet

OAKITE

Technical Service Representatives in Principal Cities of U. S. and Canada

No. 2,776,939, January 8, 1957—Anode and Method of Continuous Plating—E. Newton, assignor to Jones and Loughlin Steel Corp., Pittsburgh, Pa.

A slotted tin anode for use in alkaline tin baths is claimed to provide better plate distribution over the strip where continuous strip plating is practiced.

5 claims, 6 figures.

No. 2,777,192, January 15, 1957—Forming Printed Circuit—R. Albright and H. Golden, assignors to Philco Corp., Philadelphia, Pa.

Claim 1 states: "The method of forming a printed circuit and of soldering components thereto, which method comprises bonding a layer of aluminum to one side of a sheet of insulating material and a layer of copper to said aluminum layer to form a laminated structure, etching said layers to form a copper and aluminum circuit on said one side of said sheet, applying to and only upon spaced portions of the copper layer of said circuit a combined resist and flux composition and then acid-treating said one side of said sheet to dissolve the copper layer of said circuit while utilizing said composition as a resist agent to prevent dissolution of said coated copper portions to form an aluminum circuit on said one side of said sheet and coated contact areas on spaced portions of said aluminum circuit thereafter perforating the laminated structure of said coated contact areas and inserting component leads through the perforations so that the components remain on the other side of said sheet and the leads are secured in contact with the coated contact areas, and finally immersing said one side of said sheet in a molten solder bath while utilizing said composition as a fluxing agent at said areas and leads. See also No. 2,777,193."

4 claims, 8 figures.

No. 2,777,785, January 15, 1957—Composition for Treating Metals—L. Schuster and A. Baldi, assignors to Heintz Mfg. Co., Philadelphia, Pa.

A corrosion-resistant and organic retaining coating for metals results by coating with chromic acid which is subsequently reduced to the chromic ion. The stabilized solution consists of chromic acid (examples show 2.5 per cent), a reducing agent (examples given are triethanolamine, H_3PO_3, hydroxylamine sugar, etc.) and 0.01 to 0.5 per cent of a dissolved manganese compound ($KMnO_4$, $MnCO_3$). After immersing the work in the bath it is dried, then heated to at least 212 F.

16 claims.

No. 2,777,809, January 15, 1957—Preparation of Uranium—M. Kolodney, assignor to United States of America (AEC).

Uranium is deposited from a fused bath of 5 to 75 per cent uranium trichloride and at least one chloride selected from alkali and alkaline earth metals. Temperature is 600 to 800 C in a non-oxidizing atmosphere.

9 claims.

No. 2,778,743, January 22, 1957—Electrical Carbon Film Resistors—B. Bowman, assignor to Bell Telephone Labs., Inc., New York.

One claim states: "The method of making borocarbon-film electrical resistors with increased stability against heat, moisture, and abrasion due to increased adherence and coherence of the film, which method comprises contacting at an elevated temperature a non-conducting core with a gaseous mixture comprising chemically-bound carbon, chemically-bound boron, and chemically-bound silicon, in which mixture the ratio of the number of bound boron atoms to the number of bound carbon atoms lies between 1.00 and 0.01 and the ratio of the number of bound silicon atoms to the number of bound carbon atoms lies between 3.00 and 0.01."

1956 TECHNICAL PROCEEDINGS AVAILABLE FOR ORDER

Demand, internationally, for copies of the recently published 1956 Edition of the AES's book, TECHNICAL PROCEEDINGS, is gaining momentum. Hence, the Society's limited remaining supply is diminishing.

Containing each of the 42 papers delivered before the AES's 1956 Annual Convention, together with their charts, diagrams, graphs, tables and other illustrations, and with the verbatim discussion that followed their delivery, TECHNICAL PROCEEDINGS broadly enriches technical and scientific knowledge in the field of electroplating, metal finishing and allied arts. It totals 308 pages compared with the 1955 Edition's 255 pages.

Orders for copies will be accepted and serviced by the American Electroplaters' Society on strictly a first-come, first-served basis so long as its limited supply lasts. The domestic cost of the book is $12.50 per copy including postage. To those ordering it from outside the United States' continental limits, the charge is $15 per copy including postage cost. All orders must be accompanied by payment in full to obviate unnecessary bookkeeping expense.

Address orders to:

AMERICAN ELECTROPLATERS' SOCIETY, Inc.
445 Broad Street, Newark 2, N. J.

▼ *USE SELF-ADDRESSED Return Card to Order Books. Remittance must accompany order.*

Postage Will be Paid by Addressee

First Class Permit No. 4032, Sec. 34.9, P. L. & R. Newark, N. J.

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in the United States

AMERICAN ELECTROPLATERS' SOCIETY
445 BROAD STREET
NEWARK 2, NEW JERSEY

Att. Book Dept.

READER SERVICE CARD

July 1957. Do not use after September 15, 1957

Please send me information on the following—

Ads: A..... A..... A..... A.....
A..... A..... A.....
Tr. Lit.: L..... L..... L..... L.....
E & S E..... E..... E..... E.....

.....

Name.....Position or Title.....

Company.....

Company Address.....

City.....Zone.....State.....

PRICES FOR ELECTROPLATING SUPPLIES

Anodes

COPPER

Cast elliptical, 18 inches or longer, 5000 lb lots 47.92

Electrodeposited 39.25

BRASS, 80-20, ball anodes, 2000 lb or more .. 50.00

ZINC, ball anodes, 2000 lb lots 21.25
(for elliptical add 2¢ per lb)

NICKEL, 99 pct plus, rolled carbon $1.0225
(rolled depolarized add 3¢ per lb)

CADMIUM $1.70

TIN, ball anodes and elliptical per inch $1.07

(Cents per lb, freight allowed in quantity)

Primary Metals

GOLD, U. S. Treas., per oz $35.00

INDIUM, 99.9 per cent, per oz $2.25

LEAD, New York, cents per lb 15.10

PALLADIUM, per troy oz ..... $23 to $24

PLATINUM, per troy oz ..... $92 to $95

RHODIUM, per oz ..... $118 to $125

SILVER, New York, cents per troy oz 90.875

Chemicals

BORIC ACID, bbl. 9.95

CADMIUM OXIDE, 100 lb drum $1.70

CAUSTIC SODA, 100 lb drum 8.50

CHROMIC ACID, flake type, 1 to 20 100 lb drums 33.30

COPPER CYANIDE, 100 lb drum 74.80

COPPER SULFATE, 5 or more 100 lb bags, per cwt 24.35

NICKEL CHLORIDE, freight allowed, 300 lb. 45.50

NICKEL SULFATE, 100 lb. 40.50

POTASSIUM CYANIDE, 100 lb drum N. Y. .. 48.00

POTASSIUM STANNATE, 100 to 300 lb drums 85.70

ROCHELLE SALTS, 250 lb 48.00

SODA ASH, 100 lb. 4.77

SODIUM CYANIDE, domestic, f o b N. Y., 200 lb drums 23.05

SODIUM STANNATE, 100 to 600 lbs 68.20

ZINC CYANIDE, 100 to 900 lb 59.00

ZINC OXIDE, American process, lead free, 100 to 500 lbs. 15.5

(Cents per lb, f o b at point shipped)

Prices in effect June 12, 1957

These prices, while derived from authentic sources, may be expected to vary by geographic location, quantity purchase, FOB and other terms, market influences and variations. They are presented solely as a general guide.

First Class Permit No. 4032, Sec. 34.9, P. L. & R. Newark, N. J.

Postage Will be Paid by Addressee

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in the United States

PLATING
445 BROAD STREET
NEWARK 2, NEW JERSEY

Attn.: Reader Service Department

Book Order Card

☐ AES Member ☐ Non-Member

Please send me the following

..... This card is for ordering Books, ASTM-AES Specifications and Standards (No Charge) and PLATING Binders, $3.00

..... (Payable to American Electroplaters' Society)

Enclosed is check money order for $.....

Name .....

Company Name ..... Title .....

Address .....

City ..... Zone ..... State .....

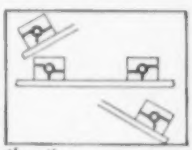
If Non-Member ☐ Please send me literature about the American Electroplaters' Society

If you don't find it here Write BELKE

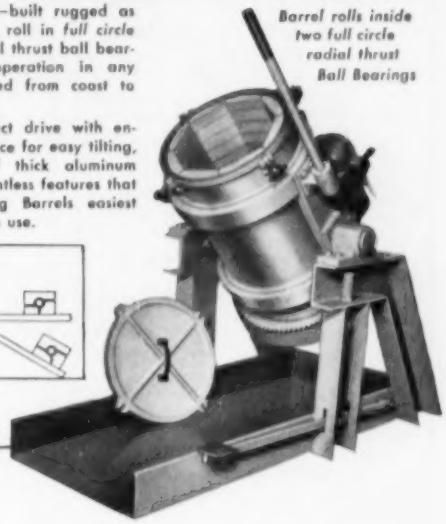
BELKE Heavy Duty Burnishing Barrels

Designed for long life—built rugged as bulldozers. The barrels roll in *full circle* patented over-size radial thrust ball bearings for antifriction operation in any position. Thousands used from coast to coast.

Gear head motor, direct drive with enclosed gears, nice balance for easy tilting, self sealing covers of thick aluminum plate, are a few of countless features that make BELKE Burnishing Barrels easiest and most economical to use.



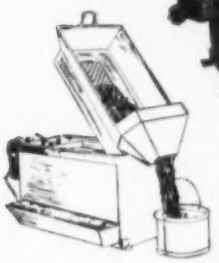
Patented radial thrust ball bearings assure smooth anti-friction rolling in any position.



Barrel rolls inside two full circle radial thrust Ball Bearings

Time Saving Separator

for Burnishing Balls, Chips or Sawdust



Just pour mixed work into hopper and press button. Motor shakes hopper and burnishing balls, chips, etc. fall through screen—leaves clean work in hopper.

Hopper tilts to pour out work—Balls, chips, etc. fall into removable tray.

Shaker rides on ball bearing rollers. Hopper sides lined with wood to protect parts with high finish.

Steam Heated Sawdust Barrel

A big money saver in drying and brightening small stampings, machine parts, castings, etc. Steel ribs welded to sides and bottom tumble the work. The hot sawdust brightens the work, eliminates stains and water spots.

Also used for other operations where heat is required such as washing or rinsing in hot solutions.

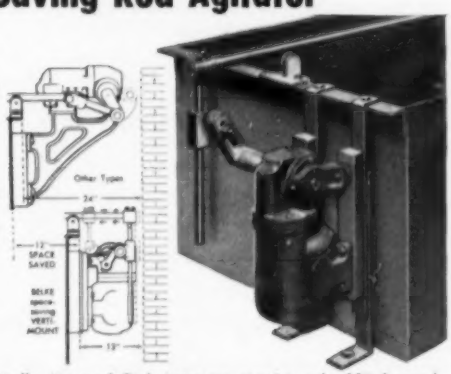
Can be furnished in combination with Sawdust Separator.

Dries work FAST with Bright, Spotless Finish.

Space Saving Rod Agitator

Saves half the space required by other rod agitators.

Easily installed on lined tanks. —Bolts to tank flange and floor— Brackets furnished for specified tank height.



BELKE Vertically Mounted Rod Agitators require only 12" beyond end of tank where others require 24". This improved agitator moves work back and forth like other rod agitators but does not lift the end of the rod. Designed for installation after tank is lined or installed.

Oblique Tumbling Barrel

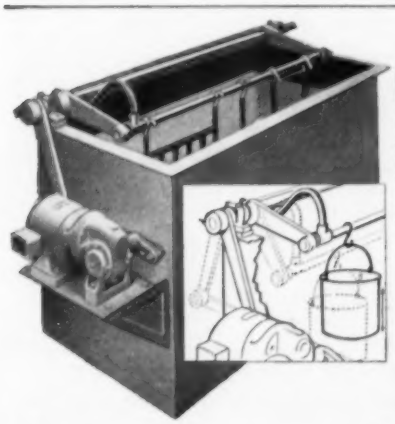
For mixing, cleaning, drying, burnishing—Just pour the work in and turn the switch. Tilt the barrel and pour out when finished.

Well balanced—tilts easily. Locks and operates at any desired angle. Approximate load capacity 2.3 cubic feet. Other sizes to order. Furnished with steel or wood barrel cylinder.

Improved Motorized Slusher

Saves 90% of time required to clean articles in cleaner bath. Just hang the work on the cross bar in baskets, on racks or on wires.

The motor moves the bar up and down, with a positive churning motion. Forces solution in and out of intricate openings difficult to clean by hand.



Belke Manufacturing Company
947 N. Cicero Ave., Chicago 51

EVERYTHING FOR PLATING PLANTS

Available for Immediate Shipment, Attractive Values

The following excellent rebuilt and guaranteed electroplating motor generator sets and rectifiers, with full control equipment:

PLATERS

1—8000/4000 AMPERE, 6/12 VOLT, **CHANDEYSSON**, Synch.

1—7500/3750 AMPERE, 9/18 VOLT, **HANSON-VAN WINKLE-MUNNING**, Synchronous.

1—6000/3000 AMPERE, 6/12 VOLT, **ELECTRIC PRODUCTS**, Synch.

1—5000/2500 AMPERE, 9/18 VOLT, **CHANDEYSSON**, Synchronous. Exciter-in-head.

1—4000/2000 AMPERE, 6/12 VOLT, **H-VW-M**, Synch., Exc.-in-head.

4—3000/1500 AMPERE, 12/24 VOLT, **CHANDEYSSON**, Exciter-in-head.

1—2500/1250 AMPERE, 9/18 VOLT, **ELECTRIC PRODUCTS**, Synchronous, Exciter-in-head, 25°C.

1—2000/1000 AMPERE, 6/12 VOLT, **HANSON-VAN WINKLE-MUNNING**.

1—1500/750 AMPERE, 12/24 VOLT, **CHANDEYSSON**, Synchronous, Exciter-in-head.

ANODIZERS

1—1000 AMPERE, 40 VOLT, **CHANDEYSSON**, 25° C.

1—1000 AMPERE, 30 VOLT, **IDEAL**, Exciter-in-head.

1—750 AMPERE, 60 VOLT, **HANSON-VAN WINKLE-MUNNING**, Synchronous. Exciter-in-head.

1—500 AMPERE, 25 VOLT, **CHANDEYSSON**, Synchronous, Exciter-in-head.

4—400 AMPERE, 40 VOLT, **M. G. C.**, Separately Excited.

RECTIFIERS

1—2000/1000 AMPERE, 6/12 VOLT, **G. E.**

1—**GREEN SELECTOPLATER**, 1800 AMPERE, 12 VOLT, Z20/3/60.

1—**SEL-REX** SELENIUM, 1200 AMPS, 9V, for 440/3/60.

1—1500/750 AMPERE, 6/12 VOLT, **UDYLITE-MALLORY**.

4—1440/720 AMPERE, 6/12 VOLT, **UDYLITE-MALLORY**.

1—750 AMPERE, 12 VOLT, SELF-CONTAINED SELENIUM, **UDYLITE-MALLORY**.

SPECIAL

2—**CROWN & H-VW-M** Centrifugal Driers No. 1 and No. 2 with Heat.

1—**H-VW-M** Full-Automatic Plating Machine, 87' long, 39" lift, was used for chrome.

1—**RONCI** Enameler, No. R-200.

1—**ALMCO** DB8 Deburring Barrel, 2 Comp. Vari Drive.

1—**ALMCO** DB-2 Deburring Bbl., lined.

Above is partial list only. Write to us for all your requirements for Plating, Anodizing and Metal Finishing

WIRE—PHONE—WRITE

M. E. BAKER CO.

25 WHEELER STREET

Kirkland 7-5460 CAMBRIDGE 38, MASS

INDUSTRY NEWS

Metalclean To Distribute Octagon Chemicals—Octagon Process, Inc., Staten Island, N. Y., has appointed Metalclean Equipment Co. as distributor in the Philadelphia-Camden area, Pennsylvania west to Harrisburg, Delaware and Maryland.

Metalclean has been engaged in the sale of Klearall 95 safety solvent during the past months and is now handling the complete Octagon specialty chemical lines. Metalclean also will carry cold and hot metal cleaners, safety solvents, paint strippers, carbon and rust removers, rust preventive oils, bright dips and phosphatizing compounds.

New England Branch for International Rectifier—International Rectifier Corp. of El Segundo, California, recently opened a New England area branch office, and has made two appointments within the sales organization.

Henry Di Mond, an electrical engineer with many years of rectifier experience, has been named District Manager of the new sales office, located at 17 Dunster Street, Cambridge 38, Massachusetts.

Simultaneously, announcement was made of the appointment of John Vickery to the post of industrial sales manager at the firm's main office in El Segundo. Mr. Vickery, formerly assistant sales manager, is an electrical engineer of more than fifteen years of direct experience in industrial heavy power rectifier applications. He has been associated with International Rectifier for the past three years.

The appointment of Herman Bloom to distributor sales manager follows more than five years' experience in electronic distributor sales management.

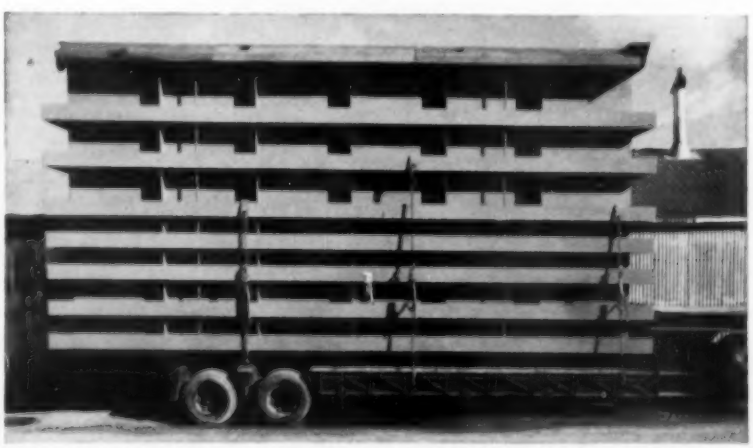
Electroplating Design Becomes Bart Laboratories and Design—S. G. Bart, president of Electroplating Design, Inc., has announced the name has been formally changed to Bart Laboratories and Design, Inc. A. G. Buschow will continue as vice president and chief engineer, and Dr. D. S. Carr has been appointed director of research. The company will continue to operate in its facilities at 231 Main Street, Belleville 9, N. J., engaging in electroplating consulting and research, design of special plating equipment, and plating plant design.

Dr. Carr, second vice president of AES Newark Branch, joined Bart Manufacturing Corp. in 1952. He had previously been with International Nickel for three years.

Mr. Buschow has been associated with Bart operations since 1944.

New Michigan Oven Distributors—Michigan Oven Co., Detroit, has two new distributors: M. D. Brandwine, Brandwine Equipment Co., St. Louis, Mo., and William J. Boschert, Brandwine Equipment Co., Kansas City, Mo.

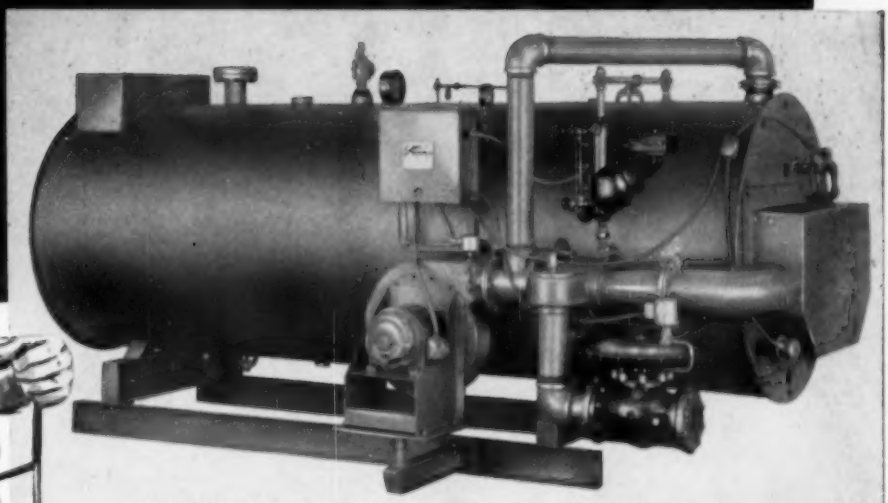
These distributors will cover the entire area surrounding the two cities.



The Metal Finishing Div. of Frederic B. Stevens, Inc., recently delivered to Reynolds Metals Co. what may be the largest processing tank for the anodizing of aluminum ever produced.

The tank measures 26 x 5 x 14 ft and has a solution capacity of 13,500 gals. It requires seven heavy gauge steel reinforcing belts to insure rigidity when filled with solution.

AT LAST A BOILER DESIGNED FOR THE PLATER!



Model 105 Sellers Closed Combustion Chamber Boiler

NOW—No more foul fumes because of incomplete combustion due to back draft through boiler created by exhaust fans or poor draft conditions.

SELLERS solves this problem with the improved design, closed combustion chamber boiler. All air for combustion, both primary and secondary, is pushed through the boiler under positive pressure, independent of partial vacuum in the building and independent of any back draft on the chimney (of course, products of combustion must be removed from building).

A positive pressure blower supplies air under pressure which is mixed with the gas and passed to burners in the completely closed combustion chamber; to complete combustion, secondary air is fed into the closed chamber under positive pressure (many times greater than the vacuum in the building). By this method of securing positive complete combustion, burned gases are pushed through the boiler and FOUL FUMES ARE ELIMINATED.

Read about these Extra Features in Catalog 5206

1. NOW—SCHOOL ROOM QUIET
2. ALL-ON, ALL-OFF RUNNER PILOTS
3. NO OPEN FLAME
4. WORKS ON LOW GAS PRESSURE
5. POSITIVE PRESSURE BLOWER OVERCOMES BUILDING VACUUM AND CHIMNEY BACK DRAFT
6. SIZES FROM 15 HP TO 200 HP

Sellers ENGINEERING CO.

4876 N. CLARK STREET CHICAGO, ILL.

Blast Heaters • Immersion Automatic Water Heaters • Combustion Units • Industrial Gas Burners
Vertical Steam Boilers • Immersion Tank Heaters • Gas Combustion Equipment

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 735.

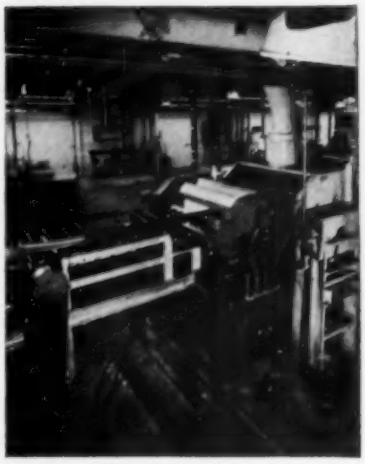
INDUSTRY NEWS

Diamond Alkali Develops Big Diaphragm Cell—America's first large-scale installation of a 30,000-amp rectangular diaphragm cell of advanced design, developed by Diamond Alkali Co., Cleveland, Ohio, for the electrolytic production of chlorine and caustic soda, will be made at the $20-million chlor-caustic plant of Wyandotte Chemicals Corp. now under construction at Geismar, La. Approximately 300 Diamond 30,000-amp rectangular diaphragm cells will be installed at Wyandotte's Geismar plant, which will increase this producer's chlorine-caustic soda capacity by nearly 60 per cent when it goes on stream in late 1958.

Parker Opens Automated Laboratory—Parker Rust Proof Co. of Detroit has opened the nation's first automated "production line" laboratory for the treatment of metal surfaces.

Developed at a cost of $300,000, the laboratory features two automatic "test tubes"—special machines capable of making actual production tests in the use of chemical coatings for the prevention of corrosion, as a paint base and as aids in cold forming.

Instead of first having to install pilot equipment to prepare for these experiments, a plant now can ship enough stock or parts for a full production test run to the Parker laboratory.



Engineers will determine the correct procedure for applying the necessary coatings for the use desired, treat the metal surfaces and return the stock or parts to the manufacturer ready for his production tests.

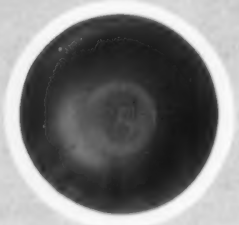
At the new laboratory, a production sample can be treated at most any speed or condition that might be required in regular production.

Stock in coils or sheets is fed into a completely automated machine which rapidly cleans the metal, rinses it, applies the necessary coatings by spray or roller method and dries the stock in a continuous operation.

Rapid Electric Detroit Branch Office—A branch office has been opened by Rapid Electric Co. of New York at 12838 Fenkell Ave., Detroit.

George DeMirjian will direct sales/service operations. Complete sales and display facilities will be offered the Detroit and surrounding area. Standard rectifier units will be stocked. A complete repair and parts replacements service also will be offered.

Why TEMCO Assures Anode Quality



Forged Ball Anode

Cast "Temanode"

Hot Rolled Oval Anode

Processing and fabricating pure electrolytic copper has been our business for over 40 years. In that time TEMCO has developed specialized facilities and skills that have gained for our products a standard of unsurpassed excellence and purity.

TEMCO Copper Anodes are made from electrolytic wire bars that are 99.92% pure. Copper is processed in our own mill and anodes are cast or forged in our own integrated shops.

The use of pure copper and the unusual centralization of facilities assures control and maintenance of our high standards throughout production.

Whether cast, forged or hot rolled, TEMCO anodes have certified purity and possess most favorable density characteristics for copper plating.

Important, too, is our established policy of faithfully and impartially serving all our customers at all times.

Ask to have our representative or nearest distributor call. For additional information, write direct, stating your requirements.

THE ELECTRIC MATERIALS CO.

NORTH EAST, PENNSYLVANIA

INDUSTRY NEWS BRIEFS

● In April Tin Research Institute announced a new, bright metal finish for electrical equipment and instrumental parts. Heretofore tin plate has not been able to compete with the bright finishes of other metals. Tin Research Institute scientists have found that the addition of a small quantity of wood tar to solutions used in tin plating causes the tin coating to be deposited as a bright finish.

● Consumption and imports of nickel in February were 18 and 38 per cent, respectively, smaller than in January, according to the Bureau of Mines, United States Department of the Interior.

Consumption of nickel in the United States by companies, which accounted for 94.7 per cent of the nickel in all forms used in 1956, was 15,239,976 lb in February, which indicated that total consumption was 16,093,000 lb, compared with 19,687,000 lb (revised figure) in January. General imports of nickel into the United States in February comprised 11,556,263 lb of metal.

The quantity of nickel contained in rolled anode bars shipped to suppliers, plus nickel used in casting anodes and nickel cathodes used as anodes in plating operations was 3,127,456 (revised figure) and 2,456,421 lb, respectively, in January and February.

● Domestic production of cadmium in the first quarter of 1957 rose 2 per cent above the preceding quarter to 2,667,000 lb and was 2 per cent above the corresponding period in 1956. The January-March output also exceeded the quarterly average of 1956 by 2 per cent and that of 1955 by 8 per cent.

Shipments of cadmium metal by producers, including internal plant consumption, dropped 6 per cent from the fourth quarter of 1956.

● Mine production of copper in the United States in March was 4 per cent greater than in February, but was 6 per cent less on a daily average basis. Export applications previously not approved by the Bureau of Foreign Commerce will be considered if the applicants certify that at least 90 per cent of the nickel content will be returned to the United States in the form of nickel metal.

● The Patent Office is still desperately in need of engineers and scientists to serve as Patent Examiners, according to The New York Patent Law Association. The Association reports that while delays in the processing of patent applications in the Patent Office have been somewhat reduced during the past year, it still takes about ten months before a new patent application is first examined, and an average of 3½ years before a patent is issued.

The key to this log jam is more Patent Examiners,—technically trained men and women who will evaluate applications for patents in the technical fields constituting industry's latest frontiers to determine whether the new suggestions are novel and whether invention is involved. While there are openings in all areas, electrical engineers and electronics specialists are particularly needed.

Men and women holding college degrees in engineering or applied science, or a degree with a major in chemistry or physics, or with certain combined credits in these fields, are eligible for appointment as Patent Examiners, without examination, upon application to the Commissioner of Patents in Washington, D. C.

● Zinc industry officials are looking to basic and applied research to aid them in their efforts to expand current markets for zinc, discover new ones.

This was the consensus of more than 250 members at the recent two day 39th annual meeting of the American Zinc Institute in Chicago.

A panel made up of AZI directors, pointed to research efforts currently being sponsored: Battelle Memorial Institute has been working for a year to evolve new ways to improve the finishing of zinc die castings, develop new and more economical plating practices, find ways to im-

Better Brass Plating

●

With ten years of experience in selling and servicing successful brass plating materials, we sometimes feel we can qualify as experts. We had a new idea when we started. Today many established customers are our best proof of quality. We can supply the information and materials that can produce brass plate of any desired color consistently. It is not an impossible task to maintain color but it does require attention. Analytical methods are available which we recommend because published methods leave much to be desired.

●

Most of all our techniques must be followed in full. Deviations, regardless of the repetition in much of the published literature, results in poor color stability, poor efficiency and narrow current density range. If you think your work can't be improved by using our methods and materials you haven't tried them. The conservative claims we make are objected to by our best customers who say we're too modest. We don't want to promise more than we can deliver but brass plating can be a more successful, faster and more trouble free operation than you ever dreamed. You can't prove it by samples or trial lots. It really takes a good production run to prove it.

●

Brass can be applied directly to steel, aluminum (zincated) and zinc die castings. We even have some who put brass on solid brass because the solid brass isn't the right color. The use of a brass flash over bright nickel is excellent and may be done in either barrels or still tanks. For top rust resistance on steel use a zinc plate followed by brass plate. Whatever business you're in—furniture, hardware and accessories, novelties, buckles, builder's hardware, nameplates, or anything requiring a brass surface, we think we can help you to help yourself.

●

We're still learning more about brass plating so we have more answers now than we did last year. We'd like to help you with your brass plating troubles.

TRUE BRITE CHEMICAL PRODUCTS CO.
98 FALLS AVENUE OAKVILLE, CONN.

USE READER SERVICE CARD; INDICATE A 737.

Haveg Equipment Solves Corrosion Problems in Handling
ACIDS · ALKALIS · SOLVENTS · HF · FUMES

First name in Corrosion Resistant Equipment

HAVEG®

HEAT EXCHANGERS
PROCESS TANKS
FUME DUCTS
PIPING
PUMPS
VALVES

HAVEG INDUSTRIES, INC.
918 Greenbank Road, Wilmington 8, Delaware
Factory: Marshallton, Del. Phone WImon 8-2271

Atlanta, Cedar 7-3821 • Chicago (Wheaton), Wheaton 8-3233 • Cleveland, WAshington 1-8700 • Detroit (Livonia), KEnwood 1-1785 • Houston (Bellaire), MOhawk 7-6519 • Los Angeles • New York (Westfield, N.J.), WEstfield 2-7383 • Seattle, Main 9004 • Denver, BEImont 7-0433 • Canada: Montreal, Glenview 7791 • Toronto, RUssell 1-3559 • Monterrey, Mexico

PERSONALS

John A. Mowrer has been named equipment product manager, Western Region, for Kelite Corporation, manufacturers of steam cleaning equipment and industrial chemicals.

Mr. Mowrer will be responsible for the development, guidance, and coordination of Kelite steam cleaner sales in Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, west Texas, Utah, Washington, and Wyoming.

He has had extensive experience in equipment sales-service, including the establishment of jobbers, distributors, and service agencies.

Mowrer

Mansfield

Frank M. Mansfield III, formerly manager of product planning and market research for General Electric's metallurgical products dept., Detroit, has been named sales manager and vice president for Wagner Brothers, Inc., producers of plating equipment and supplies, also of Detroit.

According to Joseph R. Wagner, Wagner president, Mr. Mansfield's new duties will include directing the company's field sales force and distributors. He at one time was associated with the Torrington Company, both as sales manager of the Cincinnati district, and as Detroit district engineer. He joined General Electric in 1954.

Bernard C. Lindstrom has been appointed technical sales representative in New York State, exclusive of the Metropolitan New York City area, for Heatbath Corp.

Mr. Lindstrom is a graduate of American International College with a BA in chemistry. For the past four years, he has been handling technical sales and service from the Home Office in Springfield, Mass.

Mr. Lindstrom will handle the complete line of heat treating and metal finishing products manufactured by Heatbath, and will have his headquarters in Rochester, N. Y.

William N. Lindsay Jr. has joined the staff of the Barrett Chemical Products Co. of Shelton, Conn. as sales manager. He will be responsible for relations with distributors selling the Barrett sulfamate nickel plating process and for customer service in technical application fields in which low stress nickel plating has become increasingly important.

A graduate of Trinity College, Mr. Lindsay comes to the Barrett organization following nine years' experience as technical sales representative in Connecticut for The Chemical Corporation of Springfield, Mass. Active in the American Electroplaters' Society, he is a member of the Board of Managers of the Bridgeport Branch and has for two years been a member of the Committee on Arrangements for the New England Regional Meeting. He is one of President Heiman's appointees to the special committee which is studying the Structure of the Society and which will report at the Montreal Convention.

Lindsay

Allan

Bob Allan, chemist at Lea-Michigan, Inc., Detroit, Mich., has been advanced to a post in charge of production and the laboratory. His appointment was effective April 1, 1957.

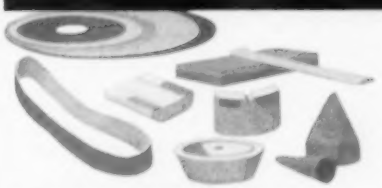
He is a graduate of Michigan State Normal College receiving a Bachelor of Science degree in chemistry in 1953. Prior to working for Lea-Michigan, he spent two years in the Army at the Engineer Center, Fort Belvoir, Virginia, as an instructor of water supply and purification.

E. R. Breining, member of Detroit Branch, AES, has joined the Commonwealth Engineering Co. of Ohio, Dayton, Ohio, as technical director of gas plating activities. Formerly, he had been supervisor of Electrochemistry Research, General Motors Research Staff at the Technical Center.

Charles R. Wirshing has been named metalworking chemicals sales manager, West Coast district, of American Chemical Paint Co., of Ambler, Pa. Mr. Wirshing became a member of the ACP sales staff, in Detroit, ten years ago and was transferred to Niles, California, in 1952.

There is a difference

Regardless of your abrasive needs—coated abrasives, grinding wheels, honing stones, abrasive grain—Mid-West, with its modern facilities, vigorous research and development and trained abrasive engineers is your one sure source for complete satisfaction.



and progressive thinking makes the difference

MID-WEST QUALITY ABRASIVES

MID-WEST ABRASIVE CO.
510 S. Washington St., Owosso, Mich.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 739.

A big step forward in barrel finishing

Improved ALUNDUM TUMBLEX* "A" abrasive brings you many new "Touch of Gold" advantages*

The new Norton TUMBLEX "A" abrasive has exceptionally long life . . . great resistance to wedging in work-piece crevices . . . adds attractive lustre . . . and can handle the widest variety of parts.

It performs several operations at once — removing flash, scale, tool marks and burrs, while forming radii and finishes to the required microinch.

It is also better sized, more uniform in shape and available in a wider range of sizes.

SIZES NOW AVAILABLE

No.	Size	No.	Size
00	1 ½" to 2"	3½	1/16" to 1/8"
0	1" to 1 ½"	4	1/32" to 1/16"
1	¾" to 1 1/16"	5	1/16" to ¼"
1½	1 1/16" to ¾"	6	¼" to 1/16"
2	5/16" to ¾"	8	1/32" to 1/8"
2½	½" to 5/16"	10	standard 10 mesh
3	1/8" to ½"	12	standard 12 mesh

Every one of these sizes has the advantages that will increase the value of your finished parts and cut the costs of your general barrel finishing. That's how improved TUMBLEX *"A" abrasive will step up your profit-boosting "Touch of Gold" to a new high.*

Send Your Work Samples

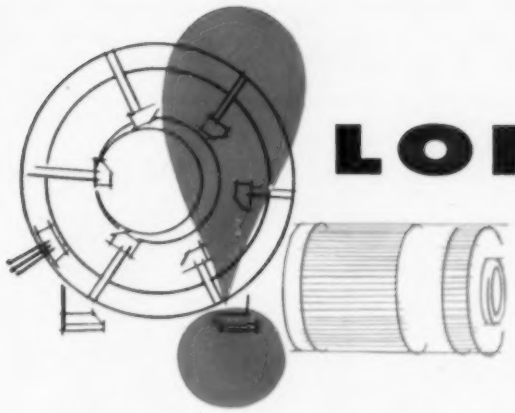
to our enlarged Sample Processing Department — and include a finished piece. We will barrel finish the samples with new TUMBLEX "A" abrasive — or any other Norton tumbling abrasive that may be more suitable — and return full information telling you exactly how you can improve product quality and cut finishing time and costs. NORTON COMPANY, *General Offices,* Worcester 6, Mass. Plants and distributors around the world.

G-310

NORTON
ABRASIVES
Making better products . . . to make your products better

NORTON PRODUCTS:
Abrasives • Grinding Wheels • Grinding Machines • Refractories
BEHR-MANNING DIVISION:
Coated Abrasives • Sharpening Stones • Behr-cat Tapes

*Trade-Marks Reg. U. S. Pat. Off. and Foreign Countries

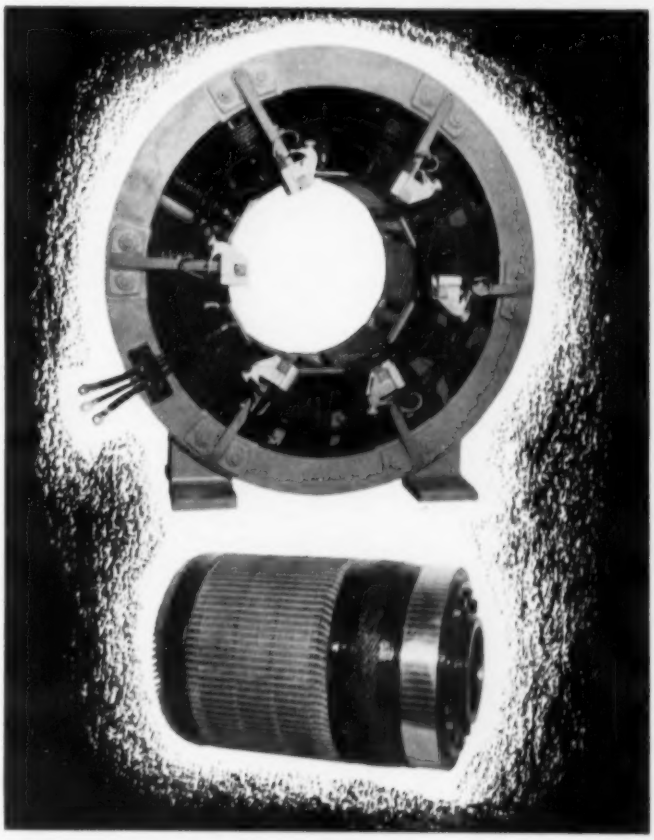


LONGER LIFE

proves motor generators are your best investment in power conversion equipment

Chandeysson **GENERATORS**

outlive by 4 to 1, provide ample overload capacity plus versatility



Chandeysson Motor Generators are built to last and last. In fact, the life of an M. G. set is more than 40 years, while that of other forms of power conversion equipment is often only 10 years. Note the large over-sized exciter commutator and open construction. Just one more reason why Chandeysson sets are capable of carrying up to 150% load for short times without damage.

These are just a few examples of Chandeysson *performance* engineering. Behind every generator are decades of engineering and manufacturing know-how . . . consistent employment of only the finest, most durable materials . . . and user testimony to highest standards of performance and life-long service. For extra capacity to meet emergencies at the lowest possible cost . . . whatever your needs are in power conversion equipment . . . insist on Chandeysson low-voltage generators.

GET ALL THE FACTS on how you can gain lifetime power dividends with a Chandeysson Motor Generator set. Mail this coupon . . . Now!

CHANDEYSSON ELECTRIC COMPANY CHA-92
4078 Bingham Avenue, St. Louis 16, Mo.

Please send new booklet D-103

Name..... *Title*.....

Company.....

Address.....

City..... *Zone*..... *State*.....

CHANDEYSSON ELECTRIC COMPANY • **4078 Bingham Avenue, St. Louis 16, Missouri**

Equipment and Supplies

Use the convenient Reader Service Card to obtain additional information on any of these items

E—700. Deburring Machine with New Reciprocating Action—An entirely new type of deburring machine, the Reciprotron, has been developed by Metal Parts Sales Co.

The machine is designed for deburring, polishing, micro inch finishing and generating radii on machined parts. The reciprocating action of the machine operates on the principle of fixturing parts in racks, which are placed into quick releasing rack holders. The fixtures and parts are reciprocated by two self-lubricating driving shafts powered by a 3 hp motor with an adjustable variable speed of 90 to 380 strokes per minute. A pan containing the proper abrasive or polishing media and solution raises to submerge the reciprocating fixtured parts in the media for a predetermined running cycle (usually from one to ten minutes).

The Model 50 Reciprotron is fully automatic, measures 94 x 36 x 84 in. and has a shipping weight of approximately 2400 lbs. Size of machine may be varied to custom specifications.

E—701. Fan of Aerodynamic Design. An axial airfoil man-cooling fan featuring aerodynamic design has been announced by Chicago Blower Corp. The pedestal-mounted fan is designed for both product and comfort cooling in steel mills, foundries, glass plants, forge rooms or almost any industrial application where a continuous, powerful flow of air is required, according to the manufacturer.

For Metal Finishers!

Pressure Moulded NEOPRENE "CAPLUGS"

7 STANDARD SIZES

	A	B	C	D	E	F	G
TO PLUG HOLE SIZE	1/8-3/16	3/16-1/4	1/4-5/16	5/16-1/2	1/2-5/8	9/16-11/16	5/8-3/4
TO CAP STUD SIZE	3/32-5/32	5/32-3/16	3/16-1/4	1/4-5/16	5/16-3/8	3/8-7/16	5/16-1/2

MASKING PROBLEMS OUR SPECIALTY!

WRITE FOR FREE SAMPLE KIT

7075 LYNDON AVENUE
DETROIT 38, MICHIGAN

DUGGAN Masking Devices

CARL E. HEUSSNER AWARD

The Carl E. Heussner Gold Medal, highest award of the American Electroplaters' Society, honors the pioneer Chrysler Motors scientist who so far advanced the industry and its techniques.
Endowed by Mr. Glenn Friedt, United Platers, Detroit, the award is made annually. This year it goes to Dr. D. G. Foulke and Dr. O. Kardos for their paper on "Current Distribution On Microprofiles."

united platers, inc.

Glenn H. Friedt, President
3456 Denton • Detroit 11, Michigan • Trinity 5-1700

E—702. New Zinc Brightener—Zinc-Kote is claimed to improve barrel plating quality of small parts.

Zinc-Kote, when added to a bath, produces bright zinc deposits on the entire surface of all the parts being plated. Bright plating is done directly from the bath to eliminate subsequent bright dipping.

The close-grained, thick zinc deposits, that are formed assure an underseal for finishes and protects the parts from rust and corrosion. A foundation is also provided for chromate finishing and bonderizing.

Because of the wide current density range, uniform zinc deposits are made on all parts within the barrel. Plating current ranges from 60 to 90 amp/sq ft, depending upon the type of work being processed.

Zinc-Kote is being marketed by the Smoothex Corporation.

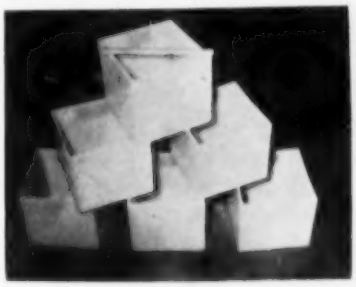
E—703. Treatment for Brass—Brasslyfe, a process that passifies and protects brass in one application has been introduced by Logo, Inc. An air dry spray material; it is claimed to passify brass and prevent tarnishing and finger stains from appearing after the parts have been shipped. Brasslyfe is also claimed to be a hard, tough, durable coating that shows weather and humidity resistance. It can be sprayed, dipped or brushed and while chemical reactions continue for several days, parts can be packaged within an hour after application.

E—704. Cadmium Brightener—Faster plating action, increased brightness and a longer brighter life are claimed for Cad-Kote, a new cadmium brightener, introduced by Smoothex, Inc.

Consistently bright deposits, created by the new brightener, impart an extremely high lustre to the entire surface of all the parts. Plating time is reduced because the need for subsequent bright dipping is eliminated.

E—705. Aluminum Anodizing Thickness Checker—R. O. Hull & Co., Inc. has a new Rohco anodicator which automatically checks thickness of anodic coatings on aluminum by dielectric spotchecks.

According to the manufacturer, dielectric testing, with the anodicator, is a simple and reproducible spotcheck on production to obtain anodic coatings conforming to customer specifications. The Rohco anodicator is claimed to provide a reliable method of testing anodized aluminum and its alloys as specified in ASTM B110-45. It incorporates two important factors in the measurement of dielectric strength (1) a uniform, slow rate of voltage increase and (2) uniform pressure of the probe on the anodic surface. It features a motor driven voltage elevator; automatically indicates the minimum voltage upon break-through when a light appears.



E—706. Polyethylene Lab Tanks—A new line of standard size, polyethylene laboratory tanks ¾ in. thick, and measuring 9 x 9 x 9 in., is now available according to the American Agile Corp.

Typical applications for the tanks, include storage of acids, developing solutions and other types of corrosive media in either liquid or solid form.

E—707. Small-Scale Ultrasonic Degreaser—A compact, small-scaled duplicate of large ultrasonic degreasers has

INDUSTRYS LARGEST PRODUCERS OF LIME BUFFING COMPOUNDS

BRAND New SCHAFFNER C-100

LIME BUFFING COMPOUND
recommended for
MIRROR FINISH ON NICKEL AND COPPER
DRY *and* CLEAN WORKING
Request for SAMPLES on your LETTERHEAD will be honored immediately
WRITE - WIRE OR PHONE - TODAY...

"Schaffner Bros. make things shine"
Bob — Paul — Gus

Schaffner
MANUFACTURING COMPANY, INC.
SCHAFFNER CENTER • ROSEWOOD 1-9902 • EMSWORTH, PITTSBURGH 2, PA.

* TRIPOLI COMPOUNDS * CHROME COLORING ROUGE * GREEN ROUGE * JEWELERS' ROUGE * CROCUS COMPOUND * STAINLESS STEEL COMPOUNDS * ALUMINUM BUFFING COMPOUNDS * ALL-PURPOSE BUFFING COMPOUNDS * WHITE COLORING COMPOUNDS * NICKEL BUFFING (LIME) * EMERY CAKE * PLASTIC BUFFING COMPOUNDS * TALLOW GREASE STICK * PUMICE GREASE STOCK * POLISHING WHEEL CEMENT * STEEL POLISHING COMPOUNDS

COMPOUNDS MADE IN BAR, SPRAY OR PASTE

been developed by the Ramco Equipment Corp., division of Randall Manufacturing Co., Inc. A further development of Ramco's U-18, the new DV-18 is a professional machine.

This bench model can be used in engineering institutions, colleges, chemical testing laboratories and even for continuous production work. It thoroughly cleans such parts as ball bearings, surgical instruments, watch and instrument parts, tools and dies, hydraulic valves, Spinnerettes. Constructed of stainless steel throughout, it features thermostatic control, filter, manual spray, copper cooling coils, stainless heater and solvent recovery system.

E—708. Silver Cleaner and Rust Remover—L & R Manufacturing Co., has announced a new L & R silver contact cleaner and rapid spread rust remover.

The new silver contact cleaner cleans with no rubbing required. Suited for removing tarnish from silver and silver plated electrical contacts, it can be reused. It is non-flammable and non-abrasive.

L & R's rapid spread rust remover was especially designed to remove rust from fine metal parts without damage to the part itself. Easily applied, the new rust remover solution provides fast action and does not contain harmful acids.

E—709. Table Tongue Sander— Latest addition to the Bush Manufacturing Co. line of abrasive belt machines is the Model T T S-2500 table tongue sander embodying several new features.

With table tilt 45° either to front or rear for predetermined I. D. or O. D. angular grinding or deburring, grinding belt head with 6 in. vertical adjustment using 90 in. abrasive belt ranging from ¼ to 2 in. wide.

E—710. Lime Buffing Composition—Slo-slake, a lime buffing composition recently developed by Frederic B. Stevens, Inc., has shown resistance to slaking after exposure to air in a series of laboratory tests.

Stevens claims the following benefits resulting from Slo-slake: Savings in compound as less composition will be discarded because of slake waste; extremely long storage life enables quantity orders with important savings; simplified cleaning with constant use of unslaked composition; constant quality, excellent cut, color and wheel performance.

E—711. Tanks Within Tanks—This is one of the latest fabricating innovations of Haveg Industries, Inc. By using new techniques, Haveg can convert old tanks into usable systems.

The tank-lining resin plastics employed are asbestos filled phenolic or furan, graphite filled epoxy, and glass reinforced polyester. These materials of construction will resist nearly all commercially encountered chemicals including acids (even hydrofluoric), alkalis and most organic liquids.

The lining of tanks by field molding or cementing can mean substantial savings. Another advantage is the safety factor offered by the field fabrication of plastic.

- High Count, Heavy Duty, Bias-cut Cloth.
- Extra folds provide wider buff face and greater compound holding capacity.
- Ventilated Steel Centers.
- Perfectly balanced sections require no raking.

FORMAX BUFFS—These famous fast cutting and long wearing buffs continue to set the standard of performance for bias-type cloth buffs. You can depend on uniform quality from shipment to shipment.

Write for Descriptive Literature

FORMAX MFG. CORP.
DETROIT 7, MICHIGAN
"THE FOUR McALEERS"

USE READER SERVICE CARD; INDICATE A 745.

FOR SALE

Slightly Used BUFFS

Loose and Sewed
Air-Cooled

Any Quantity

MICHIGAN BUFF CO., INC.
3503 GAYLORD AVE. DETROIT (12), MICHIGAN

USE READER SERVICE CARD; INDICATE A 746.

Anode Bags · Baffle Bags
Basket Saver Bags
OF EXCEPTIONAL PURITY AND UTILITY

- ALLIED bags are standard throughout the country, yet are lowest in price.
- Material especially known for strength treated for removal of starches, plastisizers, and leaf.
- Anode bags of cotton nylon, vinyon, orlon, dynel and polyethylene.

ALLIED INDUSTRIES CO. 18400 MT. ELLIOTT AVE. DETROIT 34, MICHIGAN
We make more anode bags than all other makers combined.

USE READER SERVICE CARD; INDICATE A 747.

Many old industrial tanks contain fumes and corrosive chemicals of an unknown nature. Any use of welding in or around such tanks could result in explosion or accidents; however, this danger is practically eliminated when a tank lining is molded of plastic resin.

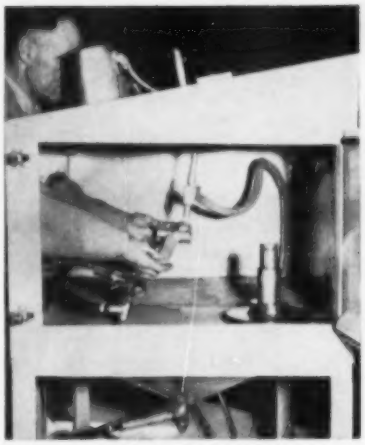
E—712. Sandblast Cabinet—A sandblast cabinet that may be used either with its adjustable mounted blast unit or with a trigger-controlled hand blast gun has been announced by Cyclone Sandblast Equipment.

It is said to permit fast production runs that lend themselves to sandblasting by mounted blast units. Yet the hand gun can be used by the same operator when he has angles and crevices which are awkward to do with any fixed unit.

The mounted unit may be raised or lowered to more conveniently blast the object, and it may be raised out of the way when the hand gun is used. The blast action of the mounted unit is controlled by a stop-and-start foot valve.

E—713. New Finishes—Allied Research Products, Inc. has announced the introduction of four new products in the Iridite family.

Iridite 5-P is a powdered concentrate that produces a yellow iridescent coating



on zinc and cadmium plate, galvanized iron and zinc die castings. The resultant finish is highly corrosion resistant and an excellent base for paint.

Iridite 8-4 is an all-purpose liquid chromate for all forms of zinc and cadmium to provide a bright finish at an economical cost.

Iridite 12-P is a powdered material designed to provide a one-dip, clear, blue-bright finish with economy and simplicity of operation on zinc-plated parts. It can be used to replace conventional nitric acid dips or other "homemade" mixes as well as for installations where supplementary dips of any type have not been used.

Iridite 14-9 is a powdered concentrate designed to provide a one-dip, clear protective treatment for aluminum surfaces. It operates at extremely low concentrations and provides an excellent degree of corrosion protection that meets the requirements of specification MIL-C-5541.

E—714. Pump Doubles Capacity—Vanton Pump & Equipment Corp., division of Cooper Alloy Corp., announces a new 40 gpm duplex flex-i-liner pump. This new model doubles the capacity of the previously largest size Vanton pump unit.

The duplex pump maintains all of the basic features of all other Vanton pumps in that there are no stuffing boxes or shaft seals. The fluid is in contact only with the outer surface of the replaceable flexible liner and the inner surface of the housing. No contact is made with any other parts. A rotor, mounted on an eccentric shaft within the flexible liner, progressively pushes the fluid about its outer surface.

Added features on the duplex pump are two fluid cavities, each activated by an eccentric 180° in opposition, allowing a balanced fluid flow free of pulsation.

ALL PURPOSE CUT AND COLOR
TRIPOLI BUFFING COMPOUND
NON FERROUS METALS

BRAND NEW
Schaffner
TRIPOLI T-300

Write in for your FREE SAMPLE BAR....
Test this NEW compound in your Plant
at OUR EXPENSE....

Request for SAMPLES on your LETTERHEAD
will be honored immediately.

BILT-IN
CLEANING AID

WRITE WIRE OR PHONE TODAY

"Schaffner Bros. make things shine"
Bob — Paul — Gus

Schaffner
MANUFACTURING COMPANY, INC.
SCHAFFNER CENTER • ROSEWOOD 1-9903 • EMSWORTH, PITTSBURGH 2, PA.

* TRIPOLI COMPOUNDS * CHROME COLORING ROUGE * GREEN ROUGE * JEWELERS' ROUGE
* CROCUS COMPOUND * STAINLESS STEEL COMPOUNDS * ALUMINUM BUFFING COMPOUNDS
* ALL-PURPOSE BUFFING COMPOUNDS * WHITE COLORING COMPOUNDS * NICKEL BUFFING (LIME) * EMERY CAKE * PLASTIC BUFFING COMPOUNDS * TALLOW GREASE STICK
* PUMICE GREASE STOCK * POLISHING WHEEL CEMENT * STEEL POLISHING COMPOUNDS

COMPOUNDS MADE IN BAR, SPRAY OR PASTE

ARTICLE REFERENCES

By
WILLIAM TUCKER
Eastman Kodak
Rochester, N.Y.

Most of the articles listed here may be obtained by writing to the publications in which the articles were published. Addresses are given at the end of the references for the reader's convenience.

Photostat or microfilm copies of articles in available magazines may be obtained from: Library of Congress, Washington, D. C.; New York Public Library, New York; Engineering Societies' Library, New York, at prevailing rates. In other cases, consult Wilson's Union List of Serials at your nearest public library for other sources of these articles.

268. ADDITION AGENTS

a. *INCLUSION OF FUCHSIN IN BRIGHT NICKEL DEPOSITS.*
J. L. Dye and O. J. Klingenmaier.
Journal of the Electrochemical Society, *104*, No. 5, May 1957, p. 275–279.

269. ANODIZING

a. *DEFECTIVE SPOTS IN ANODICALLY OXIDIZED AND DYED SHEET AND MEANS FOR THEIR AVOIDANCE.* (*German.*)
F. E. Farrell.
Aluminium, *33*, February 1957, p. 91–94.

270. AUTOMATION

a. *SHOULD JOB SHOP PLATERS AUTOMATE?*
Julian Nelkin.
The Iron Age, May 9, 1957, *179*, No. 19, p. 118–119.

271. CHROMIUM

a. *THE REPAIR OF CAR PARTS BY CHROMIUM PLATING.*
A. W. Rykowa.*
Corrosion Technology, *4*, No. 4, April 1957, p. 113–116. (*Edited by Dr. W. Summer.)

272. DIFFUSION COATINGS

a. *THE SURFACE METALLURGY OF PROTECTIVE COATINGS.*
Charles L. Faust.
Metal Progress, May 1957, *71*, No. 5, p. 101–106.

273. DISTRIBUTION

a. *THROWING INDEX—A NEW GRAPHICAL METHOD FOR EXPRESSING RESULTS OF THROWING-POWER MEASUREMENTS.*
Robert V. Jelinek and Hero F. David.
Journal of the Electrochemical Society, *104*, No. 5, May 1957, p. 279–281.

274. ELECTROPLATING

a. *SURFACE TREATMENT AND FINISHING OF LIGHT METALS. PART XII-E—PLATING ON ALUMINUM—HARD CHROMIUM AND NON-ELECTROLYTIC DEPOSITS.*
S. Wernick and R. Pinner.
Metal Finishing, *55*, No. 5, May 1957, p. 55–59.

275. ELECTROPOLISHING

a. *ELECTROLYTIC POLISHING.*
J. Bergere and R. Mondon.
Metal Industry, *90*, February 1957, p. 127–129.

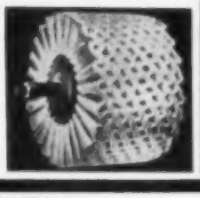
276. FINISHING

a. *BARREL FINISHING—HOW AND WHEN TO USE.*
Lester F. Spencer.
Metal Finishing, *55*, No. 5, May 1957, p. 48–54.

277. ION EXCHANGE

a. *ION EXCHANGE IN A MODERN NICKEL-CHROMIUM PLATING PLANT.*
Electroplating and Metal Finishing, *10*, No. 4, April 1957, p. 116–118.

BEAM-KNODEL CO.
Distributors for
HANSON-VAN WINKLE-MUNNING CO.'S
"PLATEMANSHIP"
A Complete Service for
ELECTROPLATING
POLISHING AND BUFFING
CLEANING AND ANODIZING
CA 6-3956-7 • 195 Lafayette Street, New York 12, N. Y.
USE READER SERVICE CARD; INDICATE A 749.

BUFFS By GUARANTEED For Finer Finishing
Complete Line of Guaranteed, Quality
BUFFS & POLISHING WHEELS
Straight and 45° "Spoke Buffs"
Patented, Ventilated and Biased
Serving the Finishing Industry for
MORE THAN 50 YEARS
GUARANTEED BUFF CO., Inc.
20 Vandam Street, New York 13, New York

USE READER SERVICE CARD; INDICATE A 751.

PROMAT
POWDERED CHROMATES
For many years Promat has been developing chromates that protect products manufactured from, or coated with zinc, cadmium and alloys of aluminum, copper and zinc. This background and Promat's high standard of control in the metal finishing operation . . . this insistence on research and the use of the finest chemicals and their controllable use, enables Promat to meet the highest standards in the metal finishing field.
For free technical information, write us today. Also send for free copy of "Promat's Progress."
PROMAT A DIVISION OF POOR & CO.
851 S. MARKET STREET · WAUKEGAN, ILLINOIS
"PROMAT MEANS PROTECTIVE MATERIALS"
USE READER SERVICE CARD; INDICATE A 750.

Zialite
Reg. U. S. Pat. Off.
for NICKEL PLATING
The one bath especially designed for plating DIRECTLY on ZINC, LEAD, ALUMINUM, BRASS, COPPER and IRON.
for HARD CHROMIUM
USE Zialite ADDITION AGENTS
Harder CRACK FREE deposits. Increased throwing power. Less sensitivity to sulfate content. Exceptionally fine results plating anything calling for Decorative or Hard Chrome.
ZIALITE CORPORATION
92 Grove Street Worcester 5, Mass.
USE READER SERVICE CARD; INDICATE A 752.

278. MATERIALS OF CONSTRUCTION

a. *CORROSION-RESISTANT FLOORS. PART 2.*
V. Evans.
Corrosion Technology, *4*, No. 4, April 1957, p. 120–124.

279. PHOSPHATING

a. *THE MODERN CHLORATE-ACCELERATED PHOSPHATING BATH.*
Edward Heinzelman, Jr.
Metal Finishing, 55, No. 5, May 1957, p. 61–64.

280. PHYSICAL PROPERTIES

a. *INFLUENCE OF HEAT TREATMENT ON THE PROPERTIES OF CHEMICAL NICKEL COATINGS PRODUCED BY THE KANIGEN PROCESS.*
Van Royen.
Electroplating and Metal Finishing, *10*, No. 4, April 1957, p. 114–115.

281. PREPARATION

a. *SCIENCE FOR ELECTROPLATERS. CHEMICAL SURFACE PREPARATION.*
L. Serota.
Metal Finishing, 55, No. 5, May 1957, p. 65–67.

282. SPECIFICATIONS

a. *HARD ANODISING OF ALUMINUM D.T.D. SPECIFICATION.*
Electroplating and Metal Finishing, *10*, No. 4, April 1957, p. 119–120.

283. STAINS

a. *STAINS ON ELECTROLYTIC DEPOSITS: ORIGIN AND REMEDIES. (French.)*
J. Liger.
Galvano, No. 241, February 1957, p. 37–39.

284. TESTING

a. *ABRASION RESISTANCE MEASUREMENT OF COATED SURFACES.*
Electroplating and Metal Finishing, *10*, No. 4, April 1957, p. 109–113.

The following are metallurgical abstracts taken from The Journal of the Institute of Metals, March 1957, pages 588 and 590.

Analysis

Determination of Fluoride in Chromium Plating Solutions. Joseph P. Branciaroli and June G. Coleman (Analyt. Chem., 1956, 28, (5), 803–804).—Excess NaOH is added to convert the H_2CrO_4 to Na_2CrO_4 and precipitate the metal contaminants as hydroxide; $AgNO_3$ is added to precipitate Ag_2CrO_4. After filtration, the colourless solution obtained is titrated with $Th(NO_3)_4$ with $ClCH_2COO^-$ byffer and Na-alizarin-sulfonate indicator. The determination can be completed in 20 minutes.

Rhodium

Some Experimental and Practical Aspects of Heavy Rhodium Plating. F. H. Reid (Bull. Inst. Metal Finishing, 1956, 6, (2), 107–142).—The results are given of laboratory studies on various types of acid Rh-plating electrolytes, with particular reference to sulfate and phosphate-sulfate solution, but including exploratory trials on phosphate, fluoborate, and sulfamate electrolytes. The sulfate electrolyte is preferred for general purposes. For the first two electrolytes, the effects of variations in preparative procedure on the characteristics of electrolytes of the same nominal composition, and the influence of composition and deposition factors on the internal stress of deposits was explored. Factors affecting the incidence of cracking of thick Rh deposits are discussed, and on the basis of laboratory and field experience, practical recommendations are made concerning the formulation of sulfate electrolytes and the optimum operating conditions for the production of Rh deposits in the thickness range 0.0002–0.002 inches from this type of solution. Procedures are detailed for either the Rh or Ag-Rh plating on the basis metals most commonly involved in industrial application. 8 ref.

Corrosion Technology
Nace
1061 M & M Bldg.
No. 1 Main St
Houston 2, Texas

Electroplating and Metal Finishing
85 Udney Park Rd.
Teddington, Middlesex
England

Iron Age
Chestnut and 56th Sts.
Philadelphia 39, Pa.

J. Electrochemical Society
216 W. 102nd St.
New York, N. Y.

J. Institute of Metals
17 Belgrave Square
London, S. W. 1, England

Metal Finishing
381 Broadway
Westwood, N. J.

Metal Industry
Louis Cassier Co., Ltd.
Dorset House
Stamford St.
London, S. E. 1, England

Metal Progress
ASM
7301 Euclid Ave.
Cleveland 3, Ohio

FOR QUALITY CONTROL
THE MOST COMPACT PLANT
AT LOWEST INSTALLED COST

DANIELS **CUSTOM PACKAGED PLATERS**

Whenever your work demands a high degree of quality and uniformity — that's when you should get all the facts on Daniels Custom Packaged Platers. Each of these completely self-contained plating plants is designed to meet your specific production needs. Daniels Custom Packed Platers have found wide acceptance in the electronics and jewelry industries, where precise quality control is a major objective. Also, you'll make these three important savings: Compactness (small floor area), low installed cost, speed of operation without sacrificing uniformity.

FREE: Write today on your letterhead for illustrated booklet describing both Daniels standard plating barrels and Custom Packaged Platers.

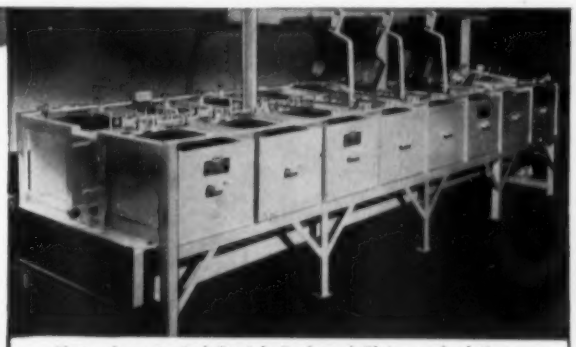
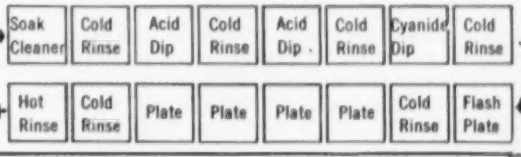


Photo shows typical Daniels Packaged Plater and plating cycle. Any sequence of operations is adaptable to their versatile units.



41 Years of Dependable Service
DANIELS PLATING BARREL & SUPPLY CO.
129 Oliver Street, Newark 5, N. J.
MArket 3-7450

Use the Reader Service Card to obtain literature

L—715. Fluorinated Hydrocarbon Solvents—A 16-page technical booklet describing properties and applications of fluorinated hydrocarbon solvents in industrial cleaning jobs, ranging from immersion and vapor cleaning of electrical motors and electronic equipment to general laboratory maintenance, has been published by the Du Pont Co.

Representing the results of research into safer, more effective solvent cleaners, the booklet contains data on comparative performance of the fluorinated compounds, chlorinated solvents like methyl chloroform, carbon tetrachloride, and trichlorethylene, and straight hydrocarbon solvents such as naphtha and gasoline. Fluorinated compounds covered specifically are Freon MF (trichloromonofluoromethane), Freon TF (trichlorotrifluoroethane), and Freon BF (tetrachlorodifluoroethane).

L—716. Descaling of Steel—A six-company report, with detailed information on how each company has used mechanical descaling of steel to increase production and save money, has been published by Wheelabrator Corp.

This 8-page booklet covers in detail the results of mechanical descaling of carbon steel strip in a producing mill. It points out how an airless abrasive blast machine, combined with flash pickle, descales carbon steel strip at a rate that would have required approximately 250 ft of pickling tanks. Acid savings and savings in expense of acid disposal also are reported.

L—717. Burnishing Wall Chart—"Your Guide to Better Burnishing" is a new 12 x 15 two-color wall chart offered by Pioneer Steel Ball Company, Inc. The illustrations include burnishing cones, balcones, diagonals, ovalbals, and pins. In addition to clearly showing the sizes in which each of these shapes is available, the chart also indicates actual dimensions of these metallic burnishing materials. Printed on stiff cardboard, the chart is suitable for hanging in production departments.

L—718. Acid Salt—A water soluble dry acid powder is fully described in Technical Data Sheet No. 43, a four-page usage and instruction sheet prepared by MacDermid Incorporated. Named Metex M-629, the new acid salt is a carefully balanced mixture of acid salts, activators and surface active agents. It can be used as an activating acid dip prior to plating steel, brass, copper or zinc base diecastings, or as a pickle for steel. Metex M-629 is said to give cleaner smut-free steel surfaces, resulting in brighter, better-adhering plated deposits, in shorter plating times.

L—719. Zinc Brightener—Literature has been released covering the advantages of a new Smoothex zinc brightener used in plating parts by the barrel method. It is claimed that the new brightener makes zinc barrel plating more dependable and reduces cost by eliminating subsequent bright dipping.

L—720. Foam Plastic Trays—To eliminate tarnishing and oxidation of silver and gold plated electronic parts, which have for so long been a headache in shipping and in-plant handling, the Polyfoam Packers Division of Glo-Brite Products of Chicago has developed packaging trays and shipping platforms of foam plastic.

Polyfoam, which is essentially expanded polystyrene foam plastic, is free of sulfur or any other trace chemicals which cause damage to bright finishes, Glo-Brite explains. Glo-Brite fabricates the Polyfoam platforms to individual requirements, with pre-punched and milled recesses to receive the parts. Literature and technical data folders are available.

L—721. Tips on Cutting Electroplating Costs—Nine ways to improve electroplating is the subject of a new, illustrated booklet available now from The Diversey Corp.

The 12-page booklet points out that proper surface preparation is the starting point for obtaining better finishes. Though not a technical bulletin on the subject of electroplating or of surface preparation, the subject matter points out nine ways to lower costs.

Some of the booklet's suggestions are: how to select the proper compound; rules of thumb for determining solution life; use of titrations; how to avoid unnecessary contamination of solutions; tips on thorough rinsing; and pointers on proper racking.

DEAR SIR:

In their article on the effect of calcium accumulation in nickel plating solutions (February, 1957, page 187), Smith and Bacon make the statement that no method has been found for eliminating calcium from these solutions, although it is important to do so in some hard water areas.

As a matter of fact, build-up of calcium can be and has been prevented by filtering the solution through certain activated clays or treating the solution with such a clay in the same manner that treatment with activated carbon is carried out. If desired, activated carbon and clay can be mixed and both treatments carried out simultaneously. As a matter of fact, the use of activated clay in this manner sometimes has other advantages too; for example, activated clay is more effective than carbon in dealing with embrittlement caused by some types of rubber accelerators.

The type of clay to which I refer is activated by treatment with acid. As a result, it has a moderate capacity for cation exchange and is able to take up calcium from the nickel solution in exchange for hydrogen ions. While this capacity is low compared to the exchange capacity of an efficient ion exchange resin, the clay is much less expensive—in fact, the clay is so inexpensive that regeneration is not worth while and the clay is discarded after use. The amount of nickel lost in the clay is negligible, from which it may be inferred that the clay takes up calcium in preference to nickel.

LOUIS WEISBERG
Chemical Engineer
New York, N. Y.

REPLY TO MR. WEISBERG:

We are very much interested in the use of activated clay for calcium removal. In the preface to our article, we indicated that calcium could be removed by ion exchange (demineralizers) but in the relatively small makeup used in the average electroplating establishment, the cost becomes excessive. With large quantities of makeup ion exchange purification becomes fairly reasonable. For the smaller operation, the use of activated clay offers an inexpensive method. We have not previously seen reference to this and would welcome information on types of clays, efficiencies and so forth.

AUSTEN J. SMITH, Head
Dept. of Metallurgical Engineering
Michigan State University

LASALCO'S Cycleflex

- No costly overhaul or rebuilding is required for cycle changing on this *most versatile of all automatics*. Only the positions of pick-up heads need be moved, plus minor tank partition changes.
- All possibility of conveyor breakdown is eliminated with the electro-mechanical control and safety device. These make it impossible to push racks into side of tank and, in case of power failure during working transfer, prevents load from dropping.
- Because no elevating mechanism operates above rack carrier unusually low headroom is needed.
- Self-cleaning heavy duty contacts have positive 6-point connection . . . practically no attention is required.
- Tank surfaces are left clear by easily removable rack carriers . . . an advantage in servicing and in manual plating of large pieces.
- Automatic loading and unloading of parts from standard double-spine racks is available.
- Where conversion coatings and bright dips are used, a delayed set-down arrangement can be furnished to work automatically with the cycle.
- Where more than one cycle is required, machine can be made to include by-passing.

Write For Brochure

Hydraulic operation, standard;
pneumatic operation, optional.

MAIL THIS TODAY!

Lasalco, Inc.
2820 LaSalle St.
St. Louis 4, Missouri
Send brochure on new fully automatic Cycleflex.

Company.....

Street Address.....

City..... Zone..... State.....

Signed.....

LASALCO, INC.

HOME OFFICE: 2820 LaSalle St. • St. Louis 4, Mo. • PRospect 1-2990
IN TEXAS: 1113 Perry Road • Irving (Dallas), Texas • BLackburn 3-4921

BRANCH NEWS

Total AES Branches U. S., Canada, Australia, June 1, 1957—56.

BRITISH COLUMBIA

Organizing Fall Plating Course

On May 24, 1957, British Columbia Branch met at Leonard's Cafe for a dinner meeting, with the general business meeting commencing at 8 p.m.

The secretary provided lapel badges with members names to be worn during meeting.

J. Lee moved and **Neil Holman** seconded that the June and last meeting of the season be held at the B.C. Building, P.N.E. grounds and should be a combined ladies and members meeting with tour of the building as follows: 7:30 to 8:15 cocktails, tour of the building including giant relief map 8:15 until 9:00, social until 9:30 followed by films until about 10:15. The motion carried. **G. Patterson** suggested provision be made for everyone to become acquainted.

Lapel buttons were shown and offered at $2 each.

Neil Holman reported on his committee's work to date for the night school course in the fall. His committee, composed of **Reg. Irwin, Bill Marquardt, Walter Kellerman** and **Dave Titmouse** had worked out tentative details as follows: 22 to 24 evenings commencing Sept. 30 approximately including—introduction, electrical, polishing and buffing, various solutions and laboratory work. The location was not settled but instructors will be Walter Kellerman and Dave Titmouse.

The secretary outlined arrangements for the proposed fall Regional Meeting with Seattle and Portland.

Bill Marquardt introduced the speaker, **Dr. Lawrence Young** of the British Columbia Research Council. He mentioned services provided free by the council before going on to his main topic—the preparation of thin films on tantalum and aluminum by electric current. These films, because of their thinness and electrical resistance, are excellent for condenser manufacture where small size is needed. This film also is available in any color depending on the length of time in the solution.

Jim Lee
Secretary

CAPITOL DISTRICT

Tour Behr-Manning Plant

About 40 Capitol District members and their guests toured the Behr-Manning Division of the Norton Co., Troy, N. Y. at the April 1 meeting of the branch. The tour was arranged by **Bob Wolf,** librarian, and included a dinner at the company cafeteria, a movie on the history and development of Behr-Manning as well as factory and engineering demonstrations. For the latter, the group was divided into three subgroups and each provided with motorized transportation to cover the extensive area. At 9:30 the group assembled and **Jack O'Connor,** president, read a few announcements in lieu of a regular meeting. Everyone was invited to the 4th Annual Clambake, to be held this year, at Endrees Willowbrook Inn. **Tony Fazzone** of Schenectady is chairman.

E. V. Raymond
Secretary

CHICAGO

Klomps Speaks on PR Copper Plating

The regular monthly technical and business meeting of the Chicago Branch was held at the Western Society of Engineers, 84 East Randolph Street.

As an experiment to see what effect a more central location based on the residence of the membership would have on attendance, it was decided to hold the June meeting at Nielson's Restaurant on North Avenue. The members are enthusiastically looking forward to a change in location, good food and ample parking.

FROM START TO FINISH

SELF PRIMING instant filtration

Automatic Backwash Reversal Switch

Model LSIN series full view Lucite Filter chamber self-priming SS-316 pump Cap. 50-350 Gal. per hr.

over 25 models designed to fit your needs from 50-3000 gal. per hr.

write for FOLDER

Sethco FILTER PUMPUNITS

Self-Priming • Automatic Back-Washing

Models equipped with corrosive resistant alloys and materials for every electroplating and industrial solution from pH 0 to pH 14. Also available; all plastic filter pump with no metal contacts. Removes particles down to one micron in size.

Sethco Mfg. Co., 2290 Babylon Turnpike, Merrick, L. I., New York

USE READER SERVICE CARD; INDICATE A 755.

IMPROVE PLATING and ALKALINE DE-RUSTING

WRITE FOR INFORMATION

WITH PERIODIC-REVERSE UNITS OF FINEST QUALITY

UNIT PROCESS ASSEMBLIES, INC.
61 East Fourth Street • New York 3, N. Y.

UPA

USE READER SERVICE CARD; INDICATE A 756.

NOTICE!

Effective July 30, 1957, the tuition fee for ELECTROPLATING KNOW HOW, the unique home study course in modern electroplating, will be advanced from $125 to $150. If you plan or have planned to enroll in this truly outstanding course which is now standard training procedure in many of the world's largest metal finishing plants and has helped hundreds of platers, foremen and chemists to advancement, do so NOW! **Save yourself $25 by enrolling at once!** JOSEPH B. KUSHNER, ELECTROPLATING SCHOOL, 115 BROAD STREET, STROUDSBURG 30P, PA.

USE READER SERVICE CARD; INDICATE A 757.

Our speaker of the evening was **Allen Klomps.** His subject was "Production Experiences in PR Copper Plating." Mr. Klomps received a degree in electrical engineering from the University of Minnesota. Since graduation he has been working in various capacities in the finishing department of the Sunbeam Corporation. One of his assignments was production foreman of the copper plating department. It was during this time that Sunbeam developed its present system of PR plating. Mr. Klomp pointed out that the successful operation is due to the development of proper equipment and its proper operation. Mr. Klomps spent considerable time describing this equipment (filtration, agitation, electrolytic purification and diaphragmed tanks). After the very interesting presentation, **Barney Case,** Sunbeam superintendent, joined in to help Mr. Klomp in the lively question and answer period that followed.

J. C. Corre

CINCINNATI

A Night with Auto Lite

The Cincinnati Branch took their spring inspection trip on Wednesday, May 22.

The evening started with a delicious dinner at the Candle Glo Inn, with 50 members and friends as guests of the Electric Auto Lite Co. After a brief business meeting, in which two applications for membership were approved, the group went to the Sharonville Division of Auto Lite which produces automobile bumpers. During the one and one-half hour trip, the visitors were able to see all of the operations and materials which go into the make-up of a bumper. The trip also included the power plant and newly expanded waste treatment facilities.

The evening was completed with refreshments in the plant cafeteria where questions about the plant and its operations were answered.

David L. Kaplan
Secretary

DAYTON

Officers Elected; Kennedy Speaks

The regular meeting for May was a dinner meeting held at Pappy's Kitchen Klub with 37 members and guests present. This being election night, the following were elected to serve for the new year: **Holle Luechauer,** president; **Jack Baker,** 1st vice president; **Bennie Cohen,** 2nd vice president; **Richard Clinchens,** secretary; **Byron Bowman,** treasurer; **Albert Wendt,** librarian; and **Robert Ruleff, John Easton** and **Ralph Collins** as the Board of Managers.

Paul Geske, Dayton Branch member of Frigidaire Div. GMC was presented and gave a short talk concerning their anodizing installations and operations.

The main speaker for the evening was **Herbert Kennedy,** technical representative, E. I. duPont de Nemours & Co. of Cincinnati, Ohio. Mr. Kennedy presented a paper "Effects of Impurities in Cyanide Plating Solutions."

Refreshments after the meeting were through the courtesy of Industrial Chemical Products Co., Dayton and their representative **Robert H. Gerber.**

One new addition was made to the membership roll.

R. M. Clinchens
Secretary

HARTFORD

Lancy on Waste Treatment

The regular Branch meeting was held on May 20 at the Bond Hotel and 36 members and guests were present. Preceding the meeting Armand Faucher presented "New Developments in the Plating Field."

The guest speaker for the evening was Dr. Leslie E. Lancy, consulting engineer in metal finishing, whose subject was "Simplified Waste Treatment Methods for the Electroplating Industry." Dr. Lancy pointed out that it is important where the effluent rinse water goes, such as fishing lakes, etc., in such cases the amount of chemicals in the water must be very small as they are toxic to the fish. If however, the water is dumped into bays, oceans or returned for industrial use the requirements are not as strict.

Normal dumping of rinse waters into municipal sewage systems has no effect, but batch dumping—emptying crocks or spent plating baths—can be very harmful. Strong acids eat into the concrete pipes and alkaline cleaners break-up oil deposits restricting the flow of water. Also toxic cyanides can affect men working in the sewer lines. Two ways were

AN IMPORTANT ANNOUNCEMENT

For many years, electroplaters have relied on Seymour Bright Nickel processes for a unique combination of plating features. These features . . . combined in Seymour Bright Nickel Solutions . . . are:—*Greater Throwing Power—High Ductility—Simplicity of Control—Freedom from Hydrogen Pitting—Efficient, Dependable Plating Results at Low Cost.*

Now Seymour chemists and plating researchers proudly introduce another exclusive improvement on the Seymour Bright Nickel process. This unusual and useful product is called . . .

CLARSOL

Seymour CLARSOL . . . already tested and in daily use by some of the country's principal plating shops . . . *improves* Seymour Bright Nickel processes because it—

- ***Gives greater tolerance to organic impurities.***
- ***Increases leveling of bright nickel deposits.***
- ***Permits plating at higher current densities.***
- ***Neutralizes the effect of excessive NC Fortifier.***

WRITE TO OUR ELECTROCHEMICAL LABORATORY FOR DETAILS!

THE SEYMOUR MANUFACTURING COMPANY
5 FRANKLIN STREET, SEYMOUR, CONNECTICUT

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 758.

mentioned for removing the chemicals from the rinse water: ion exchange and a chemical treatment using chlorine and sodium hydroxide. The integrated waste disposal treatment using inexpensive and ordinary equipment was described for the removal of most plating chemicals from rinse water.

Stanley Platoz
Secretary

LOS ANGELES
Start Annual Membership Drive

The regular monthly meeting of the Los Angeles Branch was held at Rodger Young Auditorium on Wednesday evening, May 8, 1957. After the usual social hour, approximately 88 members and guests assembled in the meeting room for a very fine dinner.

The business meeting was called to order at 8:15 by President **Magurean.** A total of 14 guests were then introduced by **Milton Weiner,** our sergeant at arms. These 14 guests represented nine different companies in this area, manufacturing and supply. Following the introduction of the guests, the minutes of the previous meeting were read by the secretary and accepted without correction or addition.

H. Hunt, treasurer, then reminded the membership that the yearly dues were overdue and should be paid as soon as possible so that our account with the National Society could be put in order.

Norman McEwan, 1st vice president, announced the start of the annual membership drive and encouraged all members to take part. He stated that there would be prizes for the first and second place winners but did not give details, this, we hope will come later. He introduced three prospective members and two new members for installation.

Under the heading of old business, the status of the ABC audit was explained to the membership and the information from the National Society was passed on to them. The membership was requested to complete their questionnaires if they had not already done so and mail them in to National Headquarters at once.

The final item of old business was the presentation of the Past President's Pin to **Truman Stoner** by our new president, George Magurean. Truman did a fine job during the past year and was given a rising vote of thanks by the entire membership.

Under new business, a summary of the advisory memo from the Department of Commerce on the current and future picture of the Nickel Supply was read by President Magurean.

The candidacy of **Dr. W. A. Wesley** of International Nickel for the 3rd vice presidency of the National Society was announced. Dr. Wesley is being sponsored by the Newark Branch and the request for our support was placed before the membership for consideration. The proposition of the renewal of our contract with Rodger Young Auditorium was then placed before the membership. Truman Stoner and President Magurean reported on other possible locations for our future meetings. It was decided to renew our contract with Rodger Young at the increased rate.

The meeting was then turned over to our librarian, **Frank Virgil,** who introduced **George H. Fox Jr.,** sales manager of the Chem Mill Division of Turco Products, Inc., and **Ned Miller,** East Coast technical representative.

Mr. Fox, assisted by Mr. Miller, gave a very able presentation of their chem mill process, illustrated by a 16 MM color film and numerous color slides. The film and slides covered the full size production installation in the North American Aviation Plant at Downey, where a number of large and small parts are processed by the Chem Mill procedure. Views of this production line included processing tanks, the building, control equipment, racking and handling equipment and the safety precautions that should be taken. They also covered Turco's experimental pilot line set up where work in magnesium, steel, stainless steel and titanium has been carried out. It was a very informative presentation and was followed by a very lively question and answer period.

E. H. Babcock
Secretary

MEMO: To the Boss Man Who pays the Bills—

WHEN READY TO BUY . . .
TRY UNIVERTICAL:

- Electro-Deposited Copper Anodes
- Rolled Electrolytic Copper Anodes
- Rolled Electrolytic Phosphorized Copper Anodes
- Cast Electrolytic Copper Anodes—All Shapes
- Rolled Tin-Lead Anodes
- Cast White Brass Anodes

Virgin metals used exclusively

UNIVERTICAL Since 1939
FOUNDRY AND MACHINE COMPANY
14841 Meyers Rd. BRoadway 3-2000 Detroit 27, Michigan

for EVERYTHING in
›ELECTROPLATING
›METAL FINISHING
Equipment and Supplies

call.. Davies®

exclusive Southwest sales and service representative for the country's leading producers of
COATINGS • EQUIPMENT
CHEMICALS • ABRASIVES

Manufacturers of Plating Racks
Engineering Service—Coating Service

Davies Supply & Manufacturing Co.

DALLAS 1, TEX.
301 N. Market St.
Riverside 7-5423

KANSAS CITY 8, MO.
813 W. 17th St.
BAltimore 1-2128

MELBOURNE

Five New Members; Technical Program

After a showing of films, the president, **K. Howard,** opened the meeting at 8.30 p.m., with 41 members and visitors present.

Five new members were elected.

The technical program began with **K. Staggard** introducing **K. Voss,** who lectured on "Plating on Aluminium," after which the meeting was thrown open for general discussion.

After a long and lively discussion period, **Mr. Esmore** proposed a vote of thanks to the speaker and congratulated him on a most enjoyable and informative lecture.

MISSISSIPPI VALLEY

Committee Appointed to Form Organic Division

Mississippi Valley Branch held their May 1957 meeting on the 15th at the American Legion in Moline, Ill. Twenty-seven members and visitors were present.

The meeting was preceded by the showing of a movie "Bright Steel" produced by Bethlehem Steel Co. on the manufacture of tin cans.

The business meeting was called to order at 9:00 by **L. O. Gilbert,** president. **Paul Chamberlain** read the names of the nominees for officers for the coming year. The motion was made by **Al Dennhardt** that since there was only one candidate for each office that a unanimous vote be cast for those candidates. Seconded by **George Parisho,** the motion carried.

A discussion of the proposed educational session followed. **Bernard Nordblom,** George Parisho, Al Dennhardt and **Stanley Baker** were appointed steering committeemen to study the proposal and make arrangements. **Harold Simon** suggested that the last week in February 1958 would be an ideal time for the session since that time would not conflict with sessions at other branches.

John Hartman reported he had 81 reservations for our Annual Banquet which is to be held Saturday, May 18. He announced there will be 25 door prizes. The chair brought up the subject of dues and urged members to pay theirs promptly.

There was further discussion of our proposed Organic Division. The success of the Milwaukee Branch was described by Lloyd Gilbert and George Parisho. John Hartman suggested that a committee be appointed to steer this project. The following were appointed: Harold Simon, Al Dennhardt, **Jake Knanishu,** George Parisho and Lloyd Gilbert.

Paul Chamberlain stated one of our delegates to the Montreal meeting, Jodie Doss, will not be able to attend, but that Stanley Baker will. None of our alternates are going and it was asked if Baker could be made a delegate. An answer was deferred pending more certainty regarding Baker's going. Al Poe made the suggestion that the delegates meet prior to the business meeting to study impending business to be acted upon.

The meeting adjourned at 10:50 p.m.

Paul G. Chamberlain
Secretary-Treasurer

MONTREAL

Ames Talks on Organic Coatings

The May 6 meeting was called to order with 30 members present. As Mr. Coady was unable to attend, **J. T. Reisenburg Sr.** presided.

Mr. Reisenburg asked Librarian **J. Rennie** to introduce the speaker of the evening, **Bart Ames** of Maas & Waldstein Co., Newark, N. J. Mr. Ames gave a very interesting talk on Organic Coatings. He was thanked on behalf of the branch by **S. Belsberg.**

Two applications for membership were approved.

Congratulations and thanks were proposed to **W. Glover** for an excellent job when he addressed the regional meeting in Syracuse on the coming convention.

W. T. Scott
Secretary-Treasurer

1956 TECHNICAL PROCEEDINGS AVAILABLE FOR ORDER

Demand, internationally, for copies of the recently published 1956 Edition of the AES's book, TECHNICAL PROCEEDINGS, is gaining momentum. Hence, the Society's limited remaining supply is diminishing.

Containing each of the 42 papers delivered before the AES's last Annual Convention, together with their charts, diagrams, graphs, tables and other illustrations, and with the verbatim discussion that followed their delivery, TECHNICAL PROCEEDINGS broadly enriches technical and scientific knowledge in the field of electroplating, metal finishing and allied arts. It totals 308 pages compared with the 1955 Edition's 255 pages.

Orders for copies will be accepted and serviced by the American Electroplaters' Society on strictly a first-come, first-served basis so long as its limited supply lasts.

The domestic cost of the book is $12.50 per copy including postage. To those ordering it from outside the United States' continental limits, the charge is $15 per copy including postage cost. All orders must be accompanied by payment in full to obviate unnecessary bookkeeping expense. Address orders to:

AMERICAN ELECTROPLATERS' SOCIETY, INC.
445 Broad Street, Newark 2, N. J.

Inserted easily . . . lapped over quickly!

• "Drumserts" are pre-formed, independent linings made of ARco-compounded neoprene or rubber . . . can be inserted in any standard 55 gallon drum in just a few seconds. "Drumserts" are rugged, clean, remain stable, and permit complete handling of drum. Prevents product contamination.

Rubber "Snap-on" lids for "Drumserts" $9.90

Write dept. "P" for details

AUTOMOTIVE RUBBER CO., INC.
12550 BEECH ROAD, DETROIT 39, MICHIGAN

NEWARK

Annual Ladies Night

Ladies Night was held in Newark on April 26 with just under 100 in attendance.

During a brief business meeting, three men were elected members and five applications accepted.

Fred Meyer, librarian, superintended the door prize drawing for the Ladies, assisted by **Louis Donroe** and **Don Foulke.** Winners were Mesdames Azzolino, Korbelak, Kincaid, LaManna, Cobb, Porter, Prine, Ehrhardt, Foulke, Lux, Hallett, Carr and Rack and Miss Polenz of door prizes donated by **Cy LaManna, John Kosmos, George Wagner, Dodd Carr** of Bart Laboratories, **George Reuter** of Wiss and Sons, **Fred Meyer, Don Foulke, Al Korbelak, Gus Bittrich, John Banta** and **Howard Cobb.**

Entertainment was provided by a lecture on and demonstration of hypnotism.

The meeting closed with refreshments.

D. Gardner Foulke
Secretary

NEWARK

Two Speakers; Spoilage Insurance Discussed

The regular meeting of the Newark Branch was held on May 17, President **Grigat** presiding. Five new members were elected and two applications for membership were turned over to the Board of Managers for action.

Doug Hallett commented that we were not getting out as many members to each meeting as we should and said that one reason was the highly technical nature of the papers presented. **F. Meyer** reported the next year's program to be well lined up and that a varied menu is planned to provide broad interest.

The secretary reported with deep regret the passing of **Royal Clark,** Founder Member of the AES, Honorary Member and past president of the Newark Branch.

Secretary **Foulke** reported a communication from an insurance agency and an interview with an underwriter regarding the need in the plating industry for insurance against spoilage of work. Interest was expressed by a number of members and it was generally agreed that this was a problem which could be worked out with NAMF.

Librarian Meyer then introduced **Charles Rohleder** of Maas and Waldstein who spoke on "Recent Developments in Organic Coatings." The various resins used for different applications such as silicones, vinyl, epoxys, polyesters, urethanes and chlorinated rubber were covered. Advances in clear lacquer, air dry and baking, and new type coatings such as multi color enamels were described.

Sidney Weisman of Curtiss-Wright Corporation, Propeller Division, spoke on "Hydrogen Embrittlement." He covered the various theories proposed to explain hydrogen embrittlement and proposed one of his own. Wedding the theoretical and practical, Mr. Weisman described the effects of hydrogen embrittlement, how it is determined, how to reduce the effects once you have it and finally steps that can be taken to minimize this condition.

D. Gardner Foulke
Secretary

NEW YORK

Foulke Installs Officers

The April 12 meeting was Ladies Nite and judging from the increasing number of ladies who attend this meeting each year, it appears quite obvious that they actually look forward to it. The attendance at this meeting, which featured the installation of officers, was well over 100.

Retiring President **D. Hartshorn Jr.** called the meeting to order. Ten new candidates were accepted and duly sworn as members by President D. Hartshorn.

Franklin MacStoker, commenting on the coming convention in Montreal, stated that the plans are quite good and that particular attention is being paid to the Ladies' program.

President Hartshorn introduced **Dr. D. Gardner Foulke** to officially install the new officers. First, however, Dr. Foulke presented Derick with a Past

DIESEL

Catering to metal finishers needs!

ANODES *(all forms and sizes)*

Nickel, Zinc, Tin, Brass, Cadmium, Copper, Silver, Lead-Antimony, For Chrome.

PLATING CHEMICALS

Nickel Sulphate, Nickel Chloride Imported, Nickel Carbonate, Nickel Acetate, Potassium Cyanide, Copper Cyanide, Zinc Cyanide, Sodium Cyanide Eggs, Cobalt Sulphate, Cadmium Oxide, Trichlorethylene—Stabilized, Perchlorethylene, Caustic Soda, Caustic Potash, All Acids, Zinc Salts No. 1, reasonable.

NEW AND USED EQUIPMENT

Prompt Deliveries—Complete Stock at all times

WE PURCHASE SCRAP METALS

DIESEL CHEMICAL COMPANY

578P Carroll St., Brooklyn 15, N.Y.

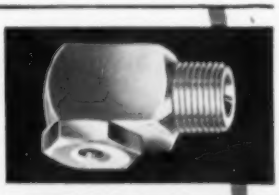
MAin 2-0703-4

"A trial will convince you"

MEMBER Metal Finishing Suppliers' Association

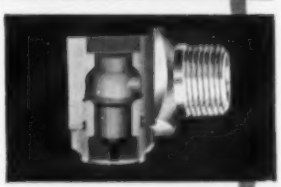
USE READER SERVICE CARD; INDICATE A 762.

Spray Nozzle types — choice of over 12,000 basic designs



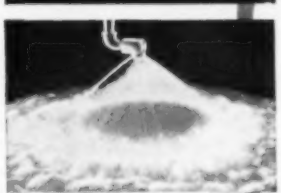
materials

brass, stainless steel, lead, hard rubber, hardened steel, tungsten carbide and many others.



performance

uniform distribution with spray angle, capacity, impact and atomization to your specifications.



to improve every spraying operation

Improve performance, lower spraying costs with Spraying Systems spray nozzles. Prompt delivery. For complete information write for Catalog 24.

SPRAYING SYSTEMS CO.

3227 RANDOLPH ST. • BELLWOOD, ILL.

ADVANCED SPRAY NOZZLE DESIGN FOR NEW DIMENSIONS IN CONTROL AND PERFORMANCE

USE READER SERVICE CARD; INDICATE A 763.

President's pin and also a traveling bag, which is a gift from the members as a token of appreciation. Dr. Foulke, well known throughout the National Society and presently serving his Newark Branch as secretary, praised highly the work of the previous officers and asked the newly-elected ones to continue the good work. The officers installed were: **Dr. Ed. Saubestre,** president; **Joseph Rembecki,** 1st vice president; **Jack Weiner,** 2nd vice president; **Arthur Carlson,** librarian; **Anthony P. Briganti,** recording secretary; **Martin Pollack,** sergeant at arms; **George Herrmann,** financial secretary; **Milton Nadel,** secretary-treasurer; **Ralph Liguori,** Board of Managers.

Following the installation ceremony a very entertaining mind reading act was presented with several of the members participating in true sportsmanlike fashion. The evening was concluded with a refreshment buffet.

Anthony P. Briganti
Recording Secretary

PHILADELPHIA

Beckwith Speaks on European Plating Practices

The regular Branch meeting was held on May 27 at the Engineers' Club with 40 attending. Guests were introduced, the minutes read and approved, two members were admitted and one application received. The chairman of the membership committee, First Vice President **Cogan,** asked for volunteers for the membership committee. The secretary suggested the make-up of the committee be on a geographical basis with a representative from each of the metropolitan areas served by the Branch. The treasurer reported the balance; **Mr. Ottens** presented the budget for 1957-58 which was adopted. **Mr. Trusdell** asked that in order to give the delegates to the Montreal Convention a free hand, that they be sent to the convention uninstructed. He also discussed the proposed changes in the Constitution as published in PLATING.

Librarian **Hauseman** introduced **Dr. M. M. Beckwith,** Harshaw Chemical Co., who spoke on European plating practices. He discussed the difference of mass production philosophy between the American and British automobile manufacturers and its bearing on methods of plating. He spoke of various plating procedures used in Europe and mentioned the use there of a plating barrel that utilizes high current densities with self loading and unloading features. Dr. Beckwith described a device used in an automatic plating machine that permitted a part to be removed from the plating tank only when the required amount of plating has been deposited. He stated that PLATING was widely read and followed.

I. Wm. Marcovitch
Secretary

ROCHESTER

Beuckman Branch President; Thiem Regional Secretary

The May meeting of the Rochester Branch was held at the Rochester Brewery Co. and called to order by President **Fred Thiem.**

Business matters discussed were: the election of one new member; the past New York State Regional Meeting at which Mr. Thiem was elected secretary of the Regional Organization for 1957-1958 and **Frank Beuckman** appointed to the Board of Managers; the election of officers follows: Frank Beuckman, president; **Roswell Minard,** 1st vice president; **Wellington Smith,** 2nd vice president; **Linwood Morrison,** secretary-treasurer; **Lorin Correll,** librarian; Board of Managers: Fred Thiem, **Donald Blum, Ed Wallin, Vern Schaeffer, Robert Flint. William Tucker,** education chairman; **Clarence VanEpps,** research finance chairman.

The meeting was turned over to our hosts, the Rochester Brewery Co. and a fine buffet lunch was served.

Linwood P. Morrison
Secretary-Treasurer

ROCKFORD

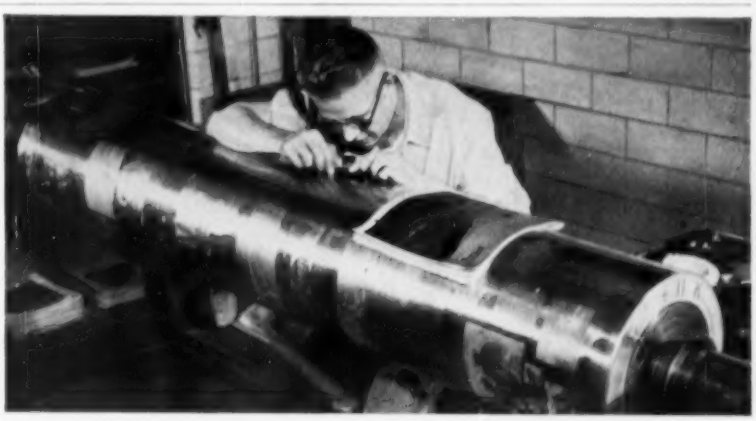
New Officers Installed

With twenty-one present for dinner and thirty-seven in attendance for the business meeting which followed, the Rockford Branch held its regular monthly meeting Monday April 8, at the Faust Hotel.

The meeting was opened by President **Bill Geissman, Vern Wissen** reported on the outcome of the Educational Session and Banquet held March 30. It proved to be a grand success.

Six new members were admitted to membership in the branch.

A motion was made and carried to hold the annual picnic June 10 at S.M.&S.F. Park. **LeRoy Johnson** was appointed



Denver Post finds "Plus-4" Anodes do a better job of plating roto cylinders

The *Denver Post* is one of the few newspapers with its own rotogravure plant. Here it prints its *Empire* magazine and its comic section—also magazine sections for the *Seattle Times* and *Portland Oregonian.* It is noted throughout the Rocky Mountain area and the Northwest for its high-quality color printing.

Two years ago, the *Denver Post* switched to "Plus-4" Anodes in electroplating the printing surfaces of the rotogravure cylinders. The first result noticed was a big reduction in sludge and loss of copper in the solution.

The cylinders come out of the plating tank so uniform that it takes very little time to polish them. The finishers report the copper is good for tooling.

The copper printing surface is superior as far as uniformity and density are concerned. The cylinders hold up for the entire run—400,000 copies in the *Empire* run—and retain full quality in the light tones.

SEE FOR YOURSELF. A trial will show you how Anaconda "Plus-4" (Phosphorized Copper) Anodes can save you time and money—give you better work. Send the coupon today. 57142

ANACONDA®
"Plus-4" Anodes
(Phosphorized Copper)
Made by
The American Brass Company

The American Brass Co., Waterbury 20, Conn.
In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

Give me details on how I can get a test quantity of "Plus-4" Anodes sufficient to supply one tank.

NAME.....
COMPANY.....
ADDRESS.....
CITY.....ZONE.....STATE.....

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 704.

chairman of the affair. **Harold Ellis** was selected to serve as chairman of the Plac-Dac to be held Sept. 12. A motion was made and carried to hold the Annual Educational Session and Banquet March 15, 1958. This was carried.

The meeting was then turned over to **Bert Harvey** of Rockford Screw products company who officially installed the new officers for the coming year.

Librarian **Bob Twining** called on **Walt Fox** to give a report on Research Project No. 18—"The Fundamentals of Polishing and Buffing." The report was very interesting.

In the absence of **Lloyd Gilbert** of the Rock Island Arsenal who was scheduled to be the speaker of the evening, Mr. Twyning introduced **Lyle Porter,** consultant, who presented a most interesting paper entitled, "Waste Disposal of Water in the Rockford Area." From the long-drawn-out question and answer period which followed it seemed quite evident a great deal was received from his presentation.

E. J. Budden
Secretary-Treasurer

ST. LOUIS

Anodizing Discussed by Hecker

The regular monthly meeting of the St. Louis Branch was held May 8 at the York Hotel with 32 members and guests present for dinner. President **Coulson** called the meeting to order, the members and guests introduced themselves. **Andy Julius** was called upon to install new officers. He thanked the outgoing officers for a good job. Mr. Coulson turned the meeting over to our new president, **Craig McAlister.**

One new member was accepted. Mr. McAlister announced, that **Gene Conroy** had accepted the chairmanship of the Entertainment Committee for another year. **Ed Sertl** reported on education: The school will continue with two semesters. The last class finished with 17 students. The school notified Mr. Sertl that the electroplating class was one of the best attended this year. Due to the good record, the school has offered to purchase equipment to make this a permanent course. A letter pertaining to plans for the next year is being drafted and will be mailed to the membership soon.

Craig McAlister introduced the idea of holding the AES convention in St. Louis in 1962.

Librarian Sertl introduced **James Hecker Jr.** of Alcoa who discussed many phases of anodizing, such as coating thickness, methods of measurement, dielectric properties, hard coat build-up and effects of alloy. His talk was illustrated by slides. A new film was shown depicting new design and processes and applications for aluminum.

SAN FRANCISCO

Electroplaters School in September

Regular monthly meeting held at Pastori's Nipa Hut, Redwood City, May 9, 1957. **Wilbur Ferry, Horace Smith** and **Jim Pope** discussed the planned School for Electroplaters which will begin with the new school year in September.

Arthur E. Schwartz
Secretary

SOUTHEASTERN

Phelan on Aluminum Dyeing; Logan on Aluminum Etching

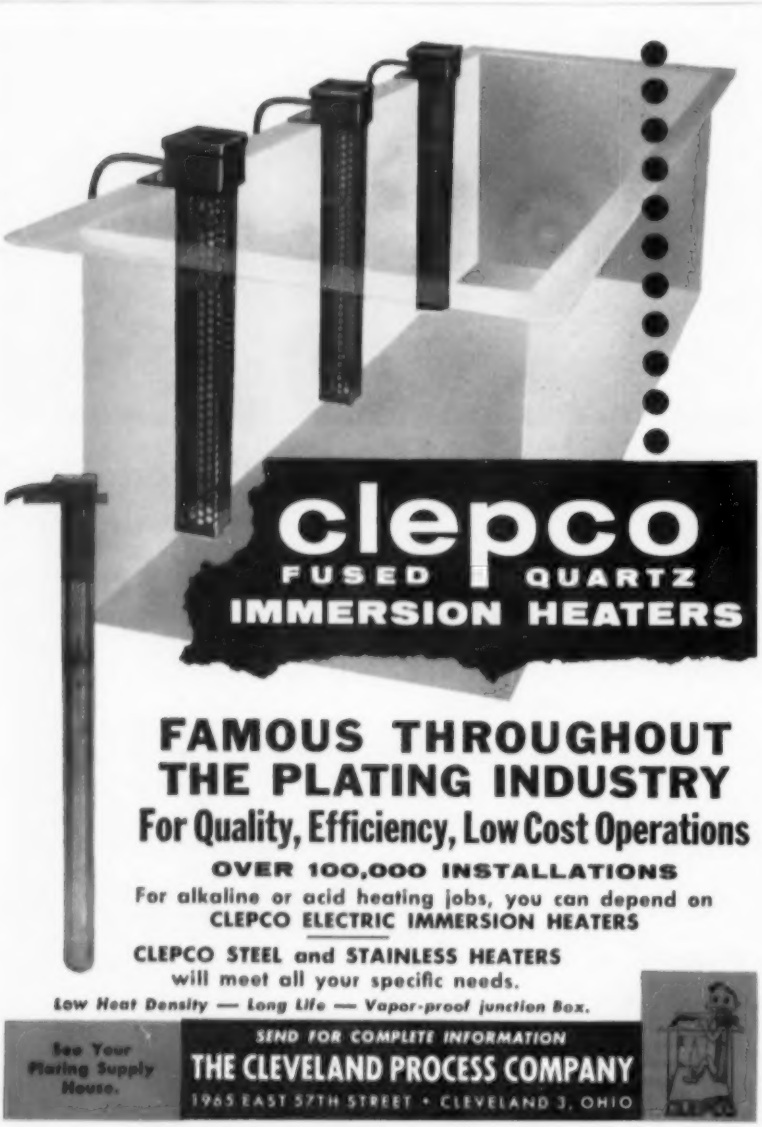
The Southeastern Branch held its last regular monthly meeting on May 10, 1957. Planning was furthered toward a Ladies' Night in August, the High School Education Program, and the 3rd Annual Technical Session. **Bernard Phelan** of National Aniline Division, Allied Chemical and Dye Corporation spoke on "Dyeing Anodized Aluminum" and **Ed. Logan** of Kelite Corporation spoke on "Aluminum Etching."

Robert H. Probert
Secretary-Treasurer

SOUTHERN TIER

Tour Eclipse Plant

Our business and educational session was highlighted by a plant tour on the afternoon of May 21, 1957. A group of approximately 34 members and guests had the pleasure of a guided tour through Eclipse Div. of Bendix Aviation Corp. in Elmira, N. Y. The bulk of the tour was to see all manufacturing operations of the Bendix brake, plus several models of automotive carburetors. Of special interest were the diecasting of the carburetors and the application of a conversion coating on the parts using an automatic plating machine. Members and guests saw more


clepco
FUSED QUARTZ
IMMERSION HEATERS
FAMOUS THROUGHOUT
THE PLATING INDUSTRY
For Quality, Efficiency, Low Cost Operations
OVER 100,000 INSTALLATIONS
For alkaline or acid heating jobs, you can depend on
CLEPCO ELECTRIC IMMERSION HEATERS
CLEPCO STEEL and STAINLESS HEATERS
will meet all your specific needs.
Low Heat Density — Long Life — Vapor-proof junction Box.
See Your Plating Supply House.
SEND FOR COMPLETE INFORMATION
THE CLEVELAND PROCESS COMPANY
1965 EAST 57TH STREET • CLEVELAND 3, OHIO

A Timely Message on

Man's Mastery Over Shortages

by Ben P. Sax

Chairman of the Board, American Buff Company

Virtually wherever and whenever man has felt the pinch of scarcity, human ingenuity has produced some method or product to counter-balance the specific need. Whether the shortage problems were those of time, materials or skills—even rainfall—man has created astounding systems to surmount the situation.

Impossible only a few short years ago, many "miracles"—even cloud-seeding—now arouse little excitement and are accepted as daily routine. Yet they are responsible for bringing yesterday's luxuries into everyday availability.

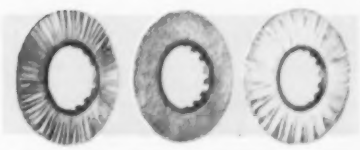
For example, the world's great dams produce gardens from barren soil, nourish and support millions of men and animals. Fast freezing conserves and permits distribution of life-giving goods, medicines, blood plasma. The need for immediate knowledge spurred the developments of electronic "wizards" which compute faster and more accurately than man can comprehend. Supersonic transportation establishes invisible highways throughout the known and unknown worlds. Automation makes a single human being the master of an intricate mechanical monster which can, without error, out-produce thousands of men and free them for new and more satisfying tasks.

In our own metal finishing industry, new types of buffs have created new peaks of production, using existing equipment with fewer workers—making possible greater output with lower unit costs. Today is but the preliminary step in an ever more marvelous world of man's victory over shortages.

Sincerely,

Ben P. Sax

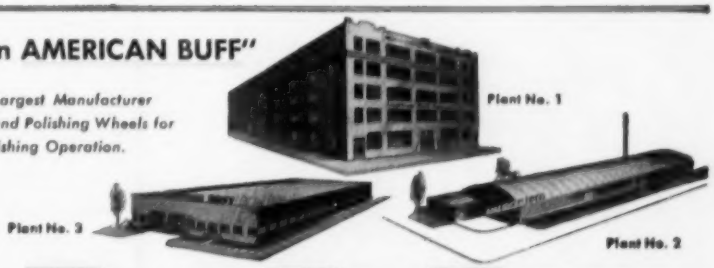
"For the job that's TOUGH—use an AMERICAN BUFF"



BIAS CLOTH • BIAS SISAL • UNIT CLOTH OR SISAL

Patented CENTERLESS Construction
Pat. No. 2,582,506

World's Largest Manufacturer of Buffs and Polishing Wheels for Every Finishing Operation.



American Buff Company
2414 S. La Salle Street Chicago 16, Illinois

AMERICAN BUFFS ARE REGULARLY ADVERTISED IN FORTUNE MAGAZINE

automation in the plating room where two more full automatics were at work.

Following this extensive plant tour the members and guests were treated to a cocktail hour, compliments of member **George Zurenda,** after which a dinner was enjoyed at Pierces Restaurant in Elmira Heights, N. Y.

The business meeting was opened by President **Charles Bound** who expressed our thanks to **Charles Cordier,** branch member and **Al Goodie,** plant manager of Eclipse Div. for a fine and interesting plant tour. After a short business meeting our educational session was opened by Librarian **Morgan Rake** who introduced the speaker of the evening **Nassan Cahan** of the Infilco Corp., who spoke on Waste Disposal. Types of waste most common to metal manufacturing plants include oily wastes, acid, alkaline, cyanide and chrome, these being the most difficult to treat properly. Special points brought out were that wastes may be treated more easily if kept separate; keep acids away from cyanides; also great emphasis placed on proper and sufficient rinsing operations in the plating department.

Two types of waste treatment include the destructive type such as breaking emulsions and secondly acid-alkali by adjusting the *p*H. Accepted method of handling cyanide is oxidizing cyanide with chlorine, 4 lb chlorine to 1 lb of cyanide.

Treatment of chrome includes precipitating trivalent chrome.

Mr. Cahan showed several slides describing extensive and complete installations now in use by several large corporations of waste treatment. Question and answer period followed the showing of slides.

B. Rossiter
Secretary

SPRINGFIELD

Installation of Officers

The Springfield Branch met for the final meeting of the season, on May 23, at the Mountain View Club, Willimansett, Mass. There were 38 members and guests present.

As soon as the steak and lobster dinners had disappeared, the installation of officers ceremony got under way. The following officers and Board of Managers were seated: President—**Charles F. Griffin Jr.**; 1st vice president—**Anthony S. Horta**; 2nd vice president—**Ralph Mongeau**; secretary—**Henry L. Heissfeld**; treasurer—**George H. Mongeau**; librarian—**Elery C. Gibson.** To serve on the Board of Managers, the following: Outgoing president, **Roger R. Heroux, Louis E. Dupuis, Frank Schulz, Alexander R. Salmond,** and **Martin Murray.** The research and finance chairman is **Melvin P. Roske.**

After these formalities, the membership repaired to the main dining room to quench parched throats and enjoy the Club's floor show.

Henry L. Heissfeld
Secretary

WATERBURY

Visit to MacDermid Laboratory

The May Meeting was held on May 9 in the Colonial Room of the Roger Smith-Elton Hotel. After dinner, the group went to visit the Service Laboratory of MacDermid, Inc. **Art McNeil** was our host for the evening and about 50 members visited the laboratory. Refreshments were furnished by MacDermid.

Dr. Erich Laue suffered a heart attack in March. He spent three weeks in the hospital and is now recuperating at home. He hopes to return to work around the end of June.

The New England Regional was probably the most successful meeting in its 18-year history. The Bingo Party drew a record attendance of over 160 ladies; the jewel pin favors (thanks to **Ray Mitchell**) were a big hit and the valuable prizes were the talk of the evening. **Buss Moran** and **Jean Strow** are to be congratulated for a job well done! The Educational

Look First To

SEELEY

Buffing Compounds

Bar—Liquid—Greaseless
Barrel Finishing Compounds

Custom Built To Reflect
Finer Finishes

E. E. SEELEY COMPANY, INC.
P. O. Box 883
Bridgeport 1, Conn.

WHEN YOU SHIP US

NICKEL DUMMY SCRAP

FROM YOUR PLATING OPERATION

WE'RE ALWAYS BUYING ALL TYPES OF NICKEL PLATER'S SCRAP . . . AT TOP PRICES

FOR PROMPT QUOTATION SEND US A 5-LB. REPRESENTATIVE SAMPLE OF YOUR ACCUMULATION

INVOICE US FOR SAMPLE . . . OR WE WILL PAY ON BASIS OF LABORATORY ANALYSIS

FOR A "SURE" THING . . . Phone . Wire . Write

Stainless Steel Corp. of America
OHIO EDISON BLDG. YOUNGSTOWN 1, OHIO Riverside 4-4123

Program in Hartford was very well attended and the speakers presented lively and interesting talks. Over 680 dinner tickets were sold and approximately 625 attended. The program, similar to the one Waterbury pioneered last year, set a record in advertising subscriptions as a result of the untiring efforts of Bridgeport Branch. Excellent cooperation of all participating Branches, under the leadership of Springfield, helped put this Regional over the top, setting new records for attendance and income.

Delegates from the five Branches in our New England Regional held a meeting in the Statler Hotel in Hartford, Thursday evening, May 2 to discuss the proposed agenda of the Montreal Convention and other Society affairs.

A business meeting is planned for May 23, 1957 at the home of **Ted Voyda** in Watertown.

WESTERN ONTARIO

General Discussion Meeting

The meeting was held on May 24 at the Wm. Pitt Hotel in Chatham. Present were 15 members and guests.

As there was no scheduled speaker, President **Earl Patterson,** turned the meeting open for general discussion on Branch affairs.

Suggestions considered included:

1. Formation of a Branch library.
2. Concerted membership drive with each member pledged to bring a guest to the September meeting.
3. Appointment of a number one delegate to Conventions and Interim Meetings whose registration fee would be paid by the Branch.

A longer than usual social session followed.

D. R. Mainland
Vice President

NEW FILM

Aluminum Finishing

(col-snd-15m-tr)

Filmed on location during the production of aircraft fuel tanks, the motion picture takes its viewers through the production cycle necessary to paint and complete the tanks. It shows exactly how paint is made to stick to metal.

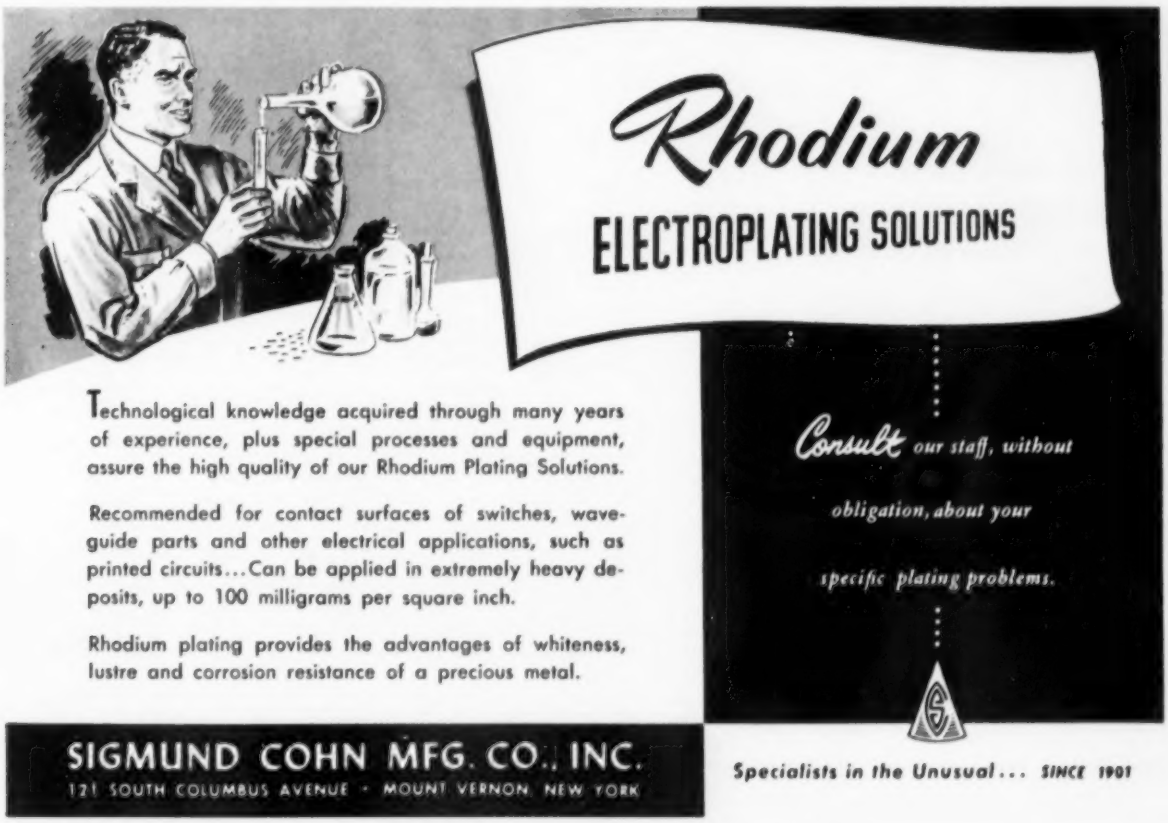
Turco Products, Inc.
6135 South Central Ave.
Los Angeles 1, California

Opportunity to Authors

Authors of technical and scientific papers on electroplating, metal finishing and related arts are cordially invited to submit manuscripts of original, unpublished papers to the Editor of PLATING for review and publishing consideration.

Any such paper accepted and published in PLATING will also become eligible, of course, for selection by the Society's PAPER AWARDS COMMITTEE for the Carl E. Heussner Award, George B. Hogaboom Award, AES Bronze Medal Award, Robert S. Leather Award, Chromium Plating Award or the Precious Metal Plating Award.

Though the submission of any such papers by AES members or non-members will be welcomed by PLATING any time during the year, this current period is particularly recommended. So as to expedite review and other processing, please write the Editor, PLATING, 445 Broad Street, Newark 2, New Jersey, for full particulars before submitting your manuscript.


Rhodium
ELECTROPLATING SOLUTIONS
Technological knowledge acquired through many years of experience, plus special processes and equipment, assure the high quality of our Rhodium Plating Solutions.
Recommended for contact surfaces of switches, waveguide parts and other electrical applications, such as printed circuits...Can be applied in extremely heavy deposits, up to 100 milligrams per square inch.
Rhodium plating provides the advantages of whiteness, lustre and corrosion resistance of a precious metal.
Consult our staff, without obligation, about your specific plating problems.
SIGMUND COHN MFG. CO., INC.
121 SOUTH COLUMBUS AVENUE · MOUNT VERNON, NEW YORK
Specialists in the Unusual... SINCE 1901

AES Membership Report

ELECTIONS

Bridgeport: D. A. Brown, E. J. Morrison, J. F. Smey

British Columbia: J. L. Gakeff, H. J. Howitson, H. D. Roberts, H. E. Sheppard

Buffalo: R. R. Brenan, J. Donalson, D. Kline, E. Lindstrom

Capitol District: D. H. Goodwin, Jr., E. E. Lavender, E. L. Pilkington, C. Stella, D. E. Wolford

Cincinnati: J. C. Claflin, J. W. Corder, B. Franklin, J. L. Hallerman, R. B. Lichliter, J. G. Pfeiffer, H. G. Smith, T. W. Wallace

Cleveland: A. W. Born, Jr., G. Zenedes

Dayton: E. P. Cooper, K. F. Jund

Detroit: J. E. Breithart, B. J. Chick, M. R. D'Amico, E. J. Durk, G. G. Gendron, B. G. Jeske, A. B. Lang, J. M. Lessinger, T. Murphy, G. A. Nahstoll, Jr., M. A. Palmiter, C. Schwall, W. A. Sugg

Hartford: E. F. Clark, N. C. Manning, A. J. Rinaldi, S. F. Sikorski, A. F. Thomforde

Houston: W. B. Adams, R. E. DeLay, Jr., C. B. Johnson

Lancaster: J. H. Mechan, J. T. Schreck, Jr.

Los Angeles: L. E. Barkley, C. B. Mortensen, G. H. Peters, J. M. Rafferty

Louisville: J. L. Waterhouse

Melbourne: E. J. Layton, I. J. Howell, N. McLeish, W. B. Tilley, R. C. Turner

Milwaukee: F. A. Brad, G. T. Felzien, W. E. Hackbarth, C. A. Hamilton

Mississippi: R. D. Eberade

Newark: R. H. Goodman, G. Martunevich, W. J. McLoughlin

New York: P. Barnard, N. Foran, L. R. Lawrence, H. Levi, J. Manister, V. J. Mineo, L. Morin, V. S. Palombella, J. E. Reynolds, J. M. Stapleford

Pittsburgh: G. Conn, J. R. Haines, R. F. Higgs, W. B. Johnson, J. W. Kerstetter, G. N. Smith

Providence-Attleboro: T. A. Babin, A. J. Boutin, W. F. Cahill

Portland: T. L. Ferguson, V. Schoenbeck, L. W. Smith

Rochester: R. H. Caudle, W. A. Elston, Jr., R. Fitzsimmons

Rockford: A. F. Anderson, W. A. Bargren, L. Cacioppi, P. T. Repka, J. Rieken, J. H. Sauntry

St. Louis: T. C. Atwood, A. W. Sommerville

Southeastern: M. B. Davis, D. Doenges, F. Fulforth

Southern Tier: H. Andresen, J. E. Darling, P. F. Diljak, C. W. Donald, C. F. Emery, R. G. Fuller P. B. Miller

Sydney: R. A. Bryant, A. Cornell

Waterbury: R. L. Bair, V. Santoro

Member-at-Large: H. Dodge, Detroit, Michigan; A. L. Hibbs, Albuquerque, New Mexico; H. D. Hughes, Surrey, England; T. Ishida, Osaka, Japan; M. Z. Khan, Allahabad, India; N. E. Nilsson, Malmo V., Sweden; E. Raub, Schwabisch Gmund, Germany

REINSTATEMENTS

Buffalo: B. Luciura, K. Merrill, W. C. Rosdahl

Detroit: C. B. Murphy, R. W. Jewell

Hartford: A. Baron, R. M. Jones

Indianapolis: A. E. Smith

New York: W. Gurzong

Saginaw Valley: D. Keely

Springfield: J. F. Horrigan

Waterbury: P. R. Mazzamaro (returned from armed forces)

TRANSFERS

Bridgeport: J. Morriss to Cleveland; R. Onkey to Toronto

Cincinnati: K. Edstrom from Chicago

Dayton: D. J. Coffey to Columbus; M. Wise to Columbus

Detroit: P. H. Douwenga from Member-at-Large; J. H. Garmager from Grand Rapids; R. W. Jewell to Grand Rapids; H. E. Nice from Cleveland; W. J. Weissburg to Cleveland

Houston: E. Lacy from Detroit

Indianapolis: M. E. Browning to Dallas-Ft. Worth

Louisville: A. D. Russell to Cleveland

Montreal: R. Kyle from Toronto

New Haven: F. A. Schneiders to Waterbury

Saginaw Valley: J. D. Horner to Detroit; J. Weick from Detroit

Seattle-Puget Sound: W. J. Marquardt to British Columbia

Springfield: E. J. Mahar to Member-at-Large

Waterbury: F. A. Schneiders from New Haven

RESIGNATIONS

Chicago: D. T. Blizzard

Dayton: G. C. Winston

Detroit: A. J. Emmerich, V. J. Gach, E. W. Jones, C. M. Knights

Houston: H. T. Hancock, E. B. Hughs

Indianapolis: R. R. Meyers

Milwaukee: D. Bartz, R. A. Heron, K. Hess, W. P. O'Brien, G. Rechlitz

Montreal: L. Brunet, P. Crepeau, C. Johntos, J. Larue, G. Laviguer

New York: J. Marymount

Philadelphia: J. R. Albert, J. L. Dearnley, F. J. Holt, E. A. Winiarski, F. Zagari

Pittsburgh: E. E. Best, Jr., L. A. Zimmerman

Rochester: B. Dewey, E. Pieper

Saginaw Valley: C. A. George, R. R. McGaw

Southeastern: F. S. Middleton

Springfield: J. J. Mongeau, Sr., P. W. Prouty

Sydney: A. E. Fowler, W. A. Pope

Toronto: F. J. Stroud

Member-at-Large: F. H. Mitchell, Warwickshire, England

SUSPENSIONS

Bridgeport: E. Silos

Buffalo: W. Beck, B. P. Fortin, F. Poland, L. H. Tressler, R. L. Wilson

Chicago: E. Beevar, H. E. Britton, R. L. Brown, F. J. Bryan, R. M. Guetzow, J. E. Morrison, H. F. O'Reilly, A. Piscator, J. R. Pulson, J. A. Reinhardt, C. B. Ross, M. A. Saporito, A. A. Schuller, J. R. Spraul, H. K. Stelter, J. Studva, O. T. Towner, R. K. Tucker, A. J. Wurster, D. A. Zarlenga

Cincinnati: T. Barringer

Dayton: P. V. Gessler

Houston: M. B. Walker

Indianapolis: T. N. Clark, Jr., K. E. Fenrich, J. O. Hillock, Jr., G. R. Miller, J. R. Rogers, W. E. Sinclair, A. E. Smith

Lancaster: L. Huber, B. E. Snyder

Louisville: T. O. Buckman

Milwaukee: F. Buschner, L. Hone, R. K. Irvine, B. Jensen, F. A. Rabe, R. R. Seeber, G. P. Varnish

Rockford: B. G. Allen

Seattle-Puget Sound: J. P. Jacobs, C. F. McCarthy, J. Seymour

DEATHS

Capitol District: J. W. Eastham

Dayton: M. A. Kenny

CLASSIFIED ADVERTISEMENTS

Only "Help Wanted" and "Situations Wanted" will be accepted. Rates: $.20 per word, minimum $5.00. AES branch members and members-at-large only, in good standing, are entitled to a total of three *free* advertisements in any twelve month period as of first insertion. Last day for inserting advertisements is the 10th of month preceding date of publication. When answering advertisements please address as follows: Box number, PLATING, 445 Broad Street, Newark 2, N. J.

FOREMAN must have experience automatic plating, painting and finishing equipment and deionizer for New York City manufacturer. Reply to Box Jy 1, PLATING, 445 Broad St., Newark 2, N. J.

TECHNICAL REPRESENTATIVE—Multi Division Industrial manufacturer offers good salary, all expenses, company car, many fringe benefits to man about 30 with background in electroplating and metal finishing. New York resident with some industrial sales experience preferred. Reply to Box Jy 2, PLATING, 445 Broad St., Newark 2, N. J.

RESEARCH CHEMIST WANTED—A Chemist of initiative and ability is wanted for the Research Laboratory of Mac Dermid, Incorporated, Waterbury, Connecticut.

Mac Dermid Incorporated is a manufacturer of metal finishing specialties and metal cleaning compounds. Interesting projects related to this field largely of inorganic, physical-chemical and electrochemical nature. A strong background in these fields as well as in analytical chemistry is required.

M.S. or equivalent research experience. Metal finishing experience desired but not necessary. Should be able to work without detailed supervision.

We offer a challenging position in a well established and expanding Company. Liberal vacation, insurance and profit sharing retirement plan benefits. Small City of Rural living. Reply to Mac Dermid, Incorporated, Waterbury 20, Connecticut. Attn.: Technical Director.

BRANCH DIRECTORY CHANGES

The Branch Directory published in the June issue was complete as of April 1, 1957. Since then, a number of Branches have held Annual Elections. As a result, the following changes bring that Branch Directory listing up-to-date.

BALTIMORE-WASHINGTON
Secretary: E. E. Oberland
2500 Broening Highway, Baltimore, Md.

BUFFALO
Secretary: R. D. Stemmerich
8090 Main St., Clarence, N. Y.
Meeting Place: Niagara Manor, Niagara Falls, N. Y.
Day of Month: First Friday
Time: Dinner 6:00 P.M.—Meeting 8:00 P.M.

CAPITOL DISTRICT
Secretary: Anthony Fazzone
Bldg. 23, Dr. 6, General Electric Co., Schenectady, N. Y.
Meeting Place: Center Inn, Albany, N. Y.

CENTRAL MICHIGAN
Meeting Place: Roosevelt Hotel, Lansing and Hayes Hotel, Jackson, Mich.
Day of Month: First Tuesday
Time: Dinner Meeting 7:00 P.M.

HOUSTON
Secretary-Treasurer: George King
Turco Products, 1606 Henderson, Houston, Texas
Meeting Place: Sonny Looks Cafe
Day of Month: Third Tuesday
Time: 6:30 P.M.

MIAMI
Meeting Place: Jerry's Restaurant, Lejuene Rd., Miami, Florida
Day of Month: Last Wednesday
Time: 7:30 P.M.

MISSISSIPPI VALLEY
Meeting Place: Moline American Legion, 1623 15th St., Moline, Ill.

PORTLAND
Meeting Place: Ione Plaza
Day of Month: Open
Time: 6:30 P.M.

SAGINAW VALLEY
Secretary-Treasurer: Charles Melekian
1857 Hosler St., Flint, Michigan

ST. LOUIS
Time: 7:00 P.M.

SEATTLE-PUGET SOUND
Meeting Place: College Club, 6th & Spring Sts., Seattle, Wash.
Day of Month: Third Tuesday
Time: Dinner 7:00 P.M.—Meeting 8:00 P.M.

SOUTHERN TIER
Secretary-Treasurer: W. Rossiter
5 Ellen St., Rt. 97, Binghamton, N. Y.
Meeting Place: Ah-wa-ga Hotel, Owego, N. Y.
and
Forest House, Athens, Pa.
Day of Month: Third Tuesday
Time: 7:00 P.M.

SYRACUSE
Meeting Place: Syracuse Turners, Inc., Turn Hall, 619 N. Salina St., Syracuse, N. Y.

Manual Available to Branches

The AES's consolidated mimeographed looseleaf book Branch Officer's Manual has been completed and copies have issued from National Headquarters to all Branches that ordered them at $5.50 per copy.

Within red covers bound by Chicago screws, the Manual contains information on respective phases of Branch operation vital to the successful workings of every AES Branch. It includes five final supplements.

A limited extra quantity of the book is still available at National Headquarters for the accommodation of Branches that have not previously ordered copies. These will be sold to Branches (only), on a first-come, first-served basis so long as that supply lasts, at $5.50 per copy, including postage to one destination.

Write American Electroplaters' Society, Inc., American Building, 445 Broad Street, Newark 2, N. J. Payment should accompany order to obviate unnecessary bookkeeping expense.

The KOCOUR SULFATE TEST SET with ELECTRIC CENTRIFUGE

. . . determines sulfate content in a chromium plating bath . . . directions are easy to follow . . . no calculations necessary . . . readings are directly in ounces per gallon.

● KOCOUR are specialists and pioneers in testing equipment for controlling plating — cleaning — pickling — anodizing — and hardening processes . . . special sets can be provided for your requirements.

Write today for further information—no cost or obligation.

KOCOUR COMPANY
4801 S. ST. LOUIS AVENUE
CHICAGO 32, ILLINOIS

Specify KOCOUR test sets from your supplier.

USE READER SERVICE CARD; INDICATE A 770.

FUTURE MEETINGS

A E S

November 2—**Philadelphia Branch,** Annual Educational Session and Banquet, Penn Sheraton Hotel, Philadelphia, Pa.

February 14-15, 1958—**Southeastern Branch,** 3rd Annual Technical Session, Dinkler-Ansley Hotel, Atlanta, Ga.

May 19-22, 1958—**45th AES Annual Convention,** Sheraton-Gibson Hotel, Cincinnati, Ohio

June 14-18, 1959—**46th AES Annual Convention,** Detroit, Mich.

July 10-14, 1960—**47th AES Annual Convention,** Hotel Statler, Los Angeles, Calif.

INTERSOCIETY

August 7-9—**6th Annual Conference on Industrial Applications of X-Ray Analysis,** Denver Research Institute, Metallurgy Division, University of Denver, Denver, Colorado

September 9-13—**12th Annual Instrument-Automation Conference and Exhibit,** Cleveland Auditorium, Cleveland, Ohio

October 6-10—**Electrochemical Society,** Fall Meeting, Statler Hotel, Buffalo, N. Y.

October 9-11—**4th Annual Symposium of High Vacuum Technology,** Hotel Somerset, Boston, Mass.

November 4-8—**39th National Metal Exposition and Congress,** International Amphitheatre, Chicago, Ill.

February 10-14, 1958—**American Society of Testing Materials,** Committee Week, Statler Hotel, St. Louis, Mo.

See June 1957 Plating for Complete Branch Directory

AES DIRECTORY

OFFICERS

President.....FRANCIS T. EDDY
Technicraft Laboratories Inc.
Thomaston-Waterbury Road, Thomaston, Conn.

First Vice President.....HERBERTH E. HEAD
Automotive Body Division
Chrysler Corporation
Detroit 31, Mich.

Second Vice President.....RALPH D. WYSONG
Studebaker-Packard Corp.
635 S. Main St., South Bend 27, Ind.

Third Vice President..DR. W. ANDREW WESLEY
International Nickel Company
Research Laboratory
Bayonne, N. J.

Past President.....DR. SAMUEL HEIMAN
Philadelphia Rust Proof Company, Inc.
3227 Frankford Avenue, Philadelphia 34, Pa.

Executive Secretary.....JOHN P. NICHOLS
445 Broad St., Newark 2, N. J.

RESEARCH COMMITTEE

Chairman.....ROBERT A. EHRHARDT
Bell Telephone Laboratories, Inc.
Murray Hill, N. J.

Vice Chairman, Research..DR. RUSSEL E. HARR
Western Electric Company, Inc.
Hawthorne Station, Chicago 23, Ill.

Vice Chairman, Finance.....GEORGE E. BEST
Mutual Chemical Division,
Allied Chemical and Dye Corporation
Block Street at Wills, Baltimore 31, Md.

Secretary-Treasurer.....JOHN P. NICHOLS
445 Broad Street, Newark 2, N. J.

PROFESSIONAL DIRECTORY

Commercial Testing and Research Organizations and Individuals offering services of technical nature to the metal finishing industries. Cost: $10 per inch on six time basis; $8 per inch on 12 time basis.

SOUTH FLORIDA TEST SERVICE
TESTING—INSPECTION—RESEARCH—ENGINEERS
Consultants and specialists in corrosion, weathering and sunlight testing.
4801 N.W. 7th St. • Miami 34, Florida

SCIENTIFIC CONTROL LABORATORIES INC.
Finishing Consultants—Registered Prof. Engineers
Control Analyses and Tests, Salt Spray, Thickness
RESEARCH—PLANNING—DEVELOPMENT
Waste Disposal: Research and Control
Telephone: Cliffside 4-2406
3136 South Kolin Avenue Chicago 23, Illinois

FINISHING PROBLEMS?
PLATING - POLISHING - LACQUERING
A complete service for all your requirements
Plant Layouts—Procedures
RALPH H. LEE
485 Keap St. Brooklyn 11, N. Y. STagg 2-2022

THE ANACHEM LABORATORIES
TESTING ANALYSES ENGINEERING
For Metal Finishers
Plating solution analyses and control. Testing of deposit-thickness, composition porosity, tensile strength. Salt Spray tests.
AIR FORCE CERTIFICATION TESTS
1724 West 58th St. Los Angeles 62, Calif.
AXminster 4-1262

GRAHAM, SAVAGE & ASSOCIATES, INC.
CONSULTING—ENGINEERING—RESEARCH
Electroplating and Metal Processing
Waste Treatment and Production Problems
Surveys—Designs—Specifications
475 York Road., Jenkintown, Pa.
Also: Chicago—Kalamazoo—New York

INDEX TO ADVERTISERS

This index is published as a service to our readers. We regret we cannot assure avoidance of inadvertent errors and omissions despite the many precautions exercised.

A

Allied Industries Co. 802
Allied Research Products 752
American Brass Co., The 813
American Buff Co. 815
Automotive Rubber Co., Inc. 811

B

Baker Co., M. E. 792
Beam-Knodel Co. 804
Belke Manufacturing Co. 791
Better Finishes & Coatings, Inc. 787
Bush Manufacturing Co. 744

C

Carborundum Co., The 754
Chandeysson Electric Co. 799
Churchill Co., Inc., George R. 774
Cleveland Process Co., The 814
Cohn Mfg. Co., Sigmund 817
Copper & Brass Sales, Inc. 000

D

Daniels Plating Barrel & Supply Co. 805
Davies Supply & Mfg. Co. 810
Diamond Alkali Co. 753
Diesel Chemical Co. 812
Duggan Masking Devices 800

E

Electric Materials Co., The 794
Enthone, Inc. 735

F

Formax Mfg. Corp. 802

G

G. S. Plastics Co. 742
Guaranteed Buff Co., Inc. 804
Gumm Chemical Co., Inc., Frederick ..... Second Cover

H

Hanson-Van Winkle-Munning Co. ..... 748, Back Cover
Harshaw Chemical Co., The 738
Haveg Industries, Inc. 797
Hull & Co., Inc., R. O. 771

I

Industrial Filter & Pump Mfg. Co. 741

K

Kocour Co. 812
Kushner, Joseph B. 808

L

Lasalco, Inc. 807
Lea Mfg. Co., The 766A
Lea Ronal, Inc. 766B
L'Hommedieu & Sons, Charles F. 744

M

MacDermid, Inc. ..... Third Cover
Meaker Co., The 756
Metal & Thermit Corp. 776
Michigan Buff Co. 802
Michigan Chrome & Chemical Co. 755
Mid-West Abrasive Co. 796
Minnesota Mining & Mfg. Co. 751
Mutual Chemical Div., Allied Chemical & Dye Corp. 746

N

National Carbon Co. 747
New Jersey Metals Co. 772
Norton Co. (Abrasive Div.) 798

O

Oakite Products, Inc. 790

P

Professional Directory 820
Promat Div. of Poor & Co. 804

R

Roto Finish Co. 749

S

Schaffner Mfg. Co., Inc. 801, 803
Seeley Co., Inc., E. E. 816
Sel-Rex Corp., Precious Metals Div. 822
Sellers Engineering Co. 793
Sethco Manufacturing Co. 808
Seymour Manufacturing Co., The 809
Solvay Process Div., Allied Chemical & Dye Corp. 788
Sparkler Manufacturing Co. 750
Spraying Sustems Co. 812
Stainless Steel Corp. of American 816
Stevens, Inc., Frederic B. 736
Stutz Manufacturing Co., George H. 775
Sulphur Products Co., Inc. 774

T

Trerice Co., H. O. 789
True Brite Chemical Products Co. 795

U

Udylite Corp. 773
United Platers, Inc. 800
Unit Process Assemblies, Inc. 808
Univertical Foundry & Machine Co. 810
U. S. Stoneware 740

W

Wagner Brothers Inc. 743
Wyandotte Chemicals Corp. 745

Z

Zialite Corp. 804

Specify the Exclusive Sel-Rex

BRIGHT GOLD PROCESS

mirror-bright directly from the bath—twice as hard as conventional 24K Gold

Schick Incorporated, like hundreds of other leading manufacturers throughout the world, specifies Sel-Rex Bright Gold. The gleaming Sel-Rex Bright Gold plated shaver head on the new Ladies' Shick is typical of the beauty and performance of this precision shaving instrument.

More dense and twice as hard as conventional 24K Gold, Sel-Rex Bright Gold has demonstrated *40% greater resistance* to wear and abrasion. For *functional* as well as decorative applications, Sel-Rex Bright Gold *must* give better service because the main objections to ordinary gold plate are completely eliminated.

The remarkable thing is that you get the beauty and desirable metallurgical properties of 24K Gold, plus the many exclusive advantages of a Sel-Rex Process, at very modest cost. Actual tests have shown that *one gram of* Sel-Rex Bright Gold *does the job of two grams* of conventional 24K Gold, in specification plating. See for yourself—send for free technical data and literature today.

Precious Metals Division

SEL-REX CORPORATION

NUTLEY 10 • NEW JERSEY

Manufacturers of Exclusive Precious Metals Processes, Metallic Power Rectifiers, Airborne Power Equipment, Liquid Clarification Filters, Metal Finishing Equipment and Supplies.

Offices. Detroit—Chicago—Los Angeles

THE SAFE, FAST, ECONOMICAL WAY TO STRIP FERROUS BASE METALS

. . . with Mac Dermid's METEX STRIP AID!

You strip nickel, brass, copper, zinc, cadmium or tin from ferrous metals safely, quickly and at low cost with METEX STRIP AID.

TRY THIS SIMPLE TEST:

Immerse a ferrous metal part in METEX STRIP AID . . .

Leave it as long as you want—even overnight!

The result: no attack . . . base metal's good as new!

METEX STRIP AID is water-soluble and may be used either hot or cold. No current needed . . . parts may be cleaned or replated with no loss of lustre on the base metal. Work can be stripped in bulk, barrels or on racks.

Write Mac Dermid for more information. Let a Mac Dermid representative show you the *safe way* to strip ferrous metals.

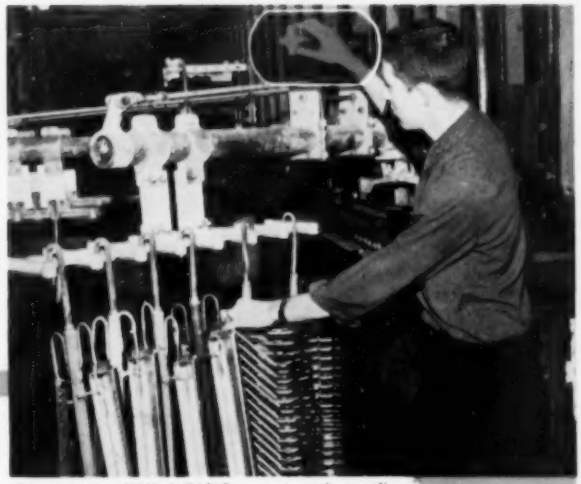
MAC DERMID
★ *Incorporated* ★
WATERBURY 20, CONNECTICUT

Complete Suppliers to the Metal Finishing Industry

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 772.

Now

automate many different finishing operations simply in one ANODIZING or ELECTROPLATING machine!



Operator sets DIAL-A-CYCLE on automatic anodizing machine in leading refrigerator parts plant. Carrier automatically by-passes or lowers parts into tanks as the dial setting dictates.

just set a dial... H-VW-M DIAL-A-CYCLE does the rest!

If you anodize or electroplate a number of different parts, each requiring a different *treatment* . . . *finish* . . . or *color*—these many separate operations can be automated in one multiple-finish conveyor with H-VW-M's remarkable new DIAL-A-CYCLE.

HERE'S HOW IT OPERATES. As racked parts are loaded on each carrier arm, a dial on the carrier is set for the particular cycle the load is to go through. Automatic conveying does the rest, lowering parts into the proper tanks, by-passing others, according to the dial setting.

As simply as that, unusual savings are realized in production time . . . labor . . . capital investment. Like to know more? Write today for facts about how DIAL-A-CYCLE can go to work in your plant! **Hanson-Van Winkle-Munning Company, Matawan, New Jersey. Offices in principal cities.**

H-VW-M

Industry's Workshop for the Finest in Plating, Anodizing, and Polishing Processes • Equipment • Supplies

PLATEMANSHIP—Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 773.